Trisomy 8 syndrome

SUMMARY Clinical and dermatoglyphic data on a male patient with complete trisomy 8 are reported and compared with those of other known cases of trisomy 8. The more discriminating findings for this condition are skeletal anomalies, restricted articular function, and speech problems.

Several reports recently discussed the clinical signs and symptoms of patients with trisomy involving chromosome No. 8, in order to delineate a characteristic picture caused by this condition. Only a few cases of complete 8 trisomy, however, have been reported (Casperson et al., 1972; Kakati et al., 1973; De Grouchy et al., 1974; Jacobsen et al., 1974; Sperber, 1975) and a wide variety of congenital malformations has been described in these patients.

The present report describes an additional case of complete 8 trisomy and summarises the available clinical and dermatoglyphic data in this condition.

Case report

A 21-year-old man is the ninth son of non-consanguineous parents. At the time of his birth the mother was 39 years old and the father 42. The mother reported the birthweight as approximately 4000 g. There is no similar case in the family.

His height was 148 cm, the weight was 25·3 kg, and the span was 143 cm. On physical examination the aspect was progeroid (Fig. 1).

There was no mental retardation and on electroencephalography the temporal leads indicated slight diffuse abnormalities in the temporal regions.

The neck was short, with right-sided rotation of the head. The thorax showed kyphoscoliosis with prominence of the right sternocostal margin. There was no cardiac malformation and the electrocardiogram was normal. The horizontal width of the trunk was narrow, with an increase in its anteroposterior diameter. There was a persistent urachus, bilateral hydronephrosis, generalised osteoporosis (bone ⩾ 15 years), and incomplete rotation of the intestinal tract, with centralisation of the caecum.

Joint movements were very restricted, except at the elbows. The hands showed camptodactyly, with well-developed interphalangeal dermal webbing, extending distally to the distal-mid-phalangeal level. The patellae were normal, there was bilateral genu valgus, and a 'hammer-type' deformity of the 3rd right and 3rd and 4th left toes.

There was generalised muscular atrophy. The external genitalia were of normal male configuration but there was no pubertal development (with absence of pubic hair and a high-pitched quiet voice).

The biparietal diameter was greater than the bitemporal diameter of the skull, which had enlarged sella turcica. The malar bones were prominent, the hair was dry and the hair-line low; these features, associated with a right-sided supraorbital ridge and eyebrow which were 0·5 cm higher than on the left side, resulted in an appearance of right pseudoenophthalmus. The palpebral fissures showed no epicantal abnormality and the corneas, pupils, and irises were normal. The root of the nose (nasion) was raised and a broad nasal base was continued to the nasion; the nasal tip was rounded, the nostrils large and everted with thin margins, which protruded beyond the lower external edge of the nasal septum. The line from the tragus to the external angle of the mouth appeared normal.

Each ear was not rotated on its long axis and was short and narrow with a squat and thickened head of helix that tapered towards the tragus; the inferior extremity of the shallow groove-like scapha opened in the external border of the ear, adjacent to the body of a normally divided antihelix. The concha was deep and straight, the tragus normal and the antitragus joined the large lobule, without an intervening groove.

The normal prominence of the cheeks was absent. The mouth was small and triangular, with eversion of
Case reports

A

1.

w

4 5

a

13

i9

14

20

iO

11

is

22

B

I8|

I4

A

4

A

22x321

Fig. 2 G-Banded karyotype from a leucocyte culture showing 8 trisomy (A) and the partial karyotypes from three metaphases (B).

the upper and lower lips. The nasal filtrum had shallow margins, with a very slight naso-labial groove overlying a prominent underlying maxillary bone. The angles of the mouth were lowered.

Further inspection confirmed the presence of microretrognathia with incomplete dental occlusion and a high palate and normal uvula. There was straight alignment of the incisor teeth, lacking the normal arcs, and a pronounced increase in the angles between the horizontal and vertical rami of the mandible.

LABORATORY INVESTIGATIONS

Normal glucose tolerance test (GTT) and insulin tolerance test (ITT); serum thyroxine (T3 and T4), creatinine, blood urea, sodium, potassium, and chloride all normal; blood count normal.

CHROMOSOME STUDIES

Analyses of standard orcein-stained preparations from the patient’s bone marrow cells (n = 25) and cultured lymphocytes (n = 91) were performed. The karyotype was 47, XY, +C in all the cells studied. Giemsa banding (Fig. 2) showed that the extra chromosome was a number 8. All other chromosomes were normal and no structural abnormalities were detected. The chromosome complements obtained from the patient’s parents and two brothers, by the examination of 50 cells each, were normal.

DERMATOGYPSH

The patient had whorls, loops, and arches on the fingertips and the total ridge count was low (70). There was a tendency to high pattern intensity on both palms, especially in the interdigital regions, with a whorl on the fourth right area (Fig. 3).

Main line formulae were 9.7.5”4-t-Au.V.V.Ld.W on the right palm and 9.7.5’3-t-Au.V/V.O.O.Ld on the left palm. The axial triradii were not distally displaced (atd maximum was 37° on the right and 40° on the left). Normal flexion creases were present on both palms.

On the soles there was a very high pattern intensity on each side, with one whorl and two loops (L1 and L2) on the right and one whorl and three loops (L3, L4, and L5) on the left over the hallucal and interdigital areas.
Fig. 3  Dermatoglyphic patterns: palms (A); soles (B).

There were bilateral arches on the great toes. The space between the first and second toes was slightly increased, bilaterally. This patient also had deep palmar and plantar skin furrows.

Discussion

A review of the published reports shows a great variation in the clinical manifestations of complete trisomy 8 cases (Table). The patient has many features in common with the previously reported cases: skeletal anomalies, restricted articular functions, low set ears, microretrogнатhia, motor retardation, and speech problems. These clinical features are also present in some patients with trisomy 8 mosaicism (Fineman et al., 1975). A meaningful evaluation of the trisomy 8 syndrome, however, has been made difficult by incompleteness of the clinical data reported.

Dermatoglyphic data on the complete trisomy 8 patients are rare and incomplete, but the data available for several patients with trisomy 8 mosaicism (Schaumann et al., 1974) were strikingly similar to those of the present case: presence of both arches and whorls on fingertips, low TRC, high palmar and plantar pattern intensity, and bilateral arches on halluces.

The patient presents some characteristic clinical features of the Warkany syndrome (Riccardi, 1976) which is associated with literal trisomy 8 (usually with mosaicism) or partial trisomy 8 (8q2): motor retardation, joint contractures, palmar and plantar skin furrows, vertebral defects, severe ureteral and renal anomalies, narrow pelvis, and a distinctive toe posture.

The authors wish to thank Dr J. Liberato F. Caboclo for referring this patient to us and Drs Eduardo H. Castilla and Iris Ferrari, for clinical and cytogenetical support.

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Table  Clinical findings of patients with complete trisomy 8

<table>
<thead>
<tr>
<th>Clinical findings</th>
<th>Present case</th>
<th>Literature</th>
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<tbody>
<tr>
<td>Mental/motor retardation</td>
<td>+</td>
<td>6/6 (1, 2, 4, 5, 8)</td>
</tr>
<tr>
<td>Skeletal anomalies</td>
<td>+</td>
<td>6/6 (1, 2, 3, 5, 8)</td>
</tr>
<tr>
<td>Normal birthweight</td>
<td>+</td>
<td>5/6 (1, 2, 4, 5)</td>
</tr>
<tr>
<td>Clinical deafness</td>
<td>-</td>
<td>5/6 (1, 4, 5, 8)</td>
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<tr>
<td>Normal pregnancy and delivery</td>
<td>-</td>
<td>4/5 (1, 2, 4)</td>
</tr>
<tr>
<td>Strabismus</td>
<td>-</td>
<td>3/5 (1, 8)</td>
</tr>
<tr>
<td>Low set ears</td>
<td>+</td>
<td>3/5 (1, 2, 5)</td>
</tr>
<tr>
<td>Ureteral-renal anomalies</td>
<td>+</td>
<td>2/4 (3, 8)</td>
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<tr>
<td>Cleft or high palate</td>
<td>+</td>
<td>2/4 (1, 3, 5)</td>
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<tr>
<td>Speech problems</td>
<td>+</td>
<td>3/3 (1, 2, 4, 8)</td>
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<tr>
<td>Micrognathia/trigonoñathia</td>
<td>+</td>
<td>3/3 (1, 2, 5)</td>
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<tr>
<td>Prominent forehead</td>
<td>-</td>
<td>2/3 (4, 5, 9)</td>
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<tr>
<td>High intensity of palmar patterns</td>
<td>+</td>
<td>2/2 (2, 4)</td>
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<tr>
<td>Restricted articular functions</td>
<td>+</td>
<td>2/2 (2, 4)</td>
</tr>
<tr>
<td>Palmar and plantar furrows</td>
<td>+</td>
<td>2/2 (4, 8)</td>
</tr>
<tr>
<td>Scoliosis</td>
<td>+</td>
<td>2/2 (4, 8)</td>
</tr>
<tr>
<td>Everted lower lip</td>
<td>+</td>
<td>1/2 (1)</td>
</tr>
<tr>
<td>High intensity of plantar patterns</td>
<td>+</td>
<td>1/1 (4)</td>
</tr>
<tr>
<td>Abnormal electroencephalogram</td>
<td>+</td>
<td>1/1 (4)</td>
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<tr>
<td>Diffuse muscular atrophy</td>
<td>+</td>
<td>0/0</td>
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<tr>
<td>Absent or small patella</td>
<td>-</td>
<td>0/0</td>
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*Number of cases in which this feature is commented upon. Reference numbers are given in parentheses.
Trisomy 18 syndrome with an unusual karyotype: possible double isochromosome

SUMMARY Chromosome analysis of an infant with characteristic features of trisomy 18 is presented. The chromosome complement contained a modal count of 47 but there was only one No. 18. In addition, there were two metacentric chromosomes of different sizes. The two metacentric chromosomes were identified by G- and C-banding to be possible isochromosomes of the long and short arms of a No. 18 chromosome.

Trisomy 18 (Edwards' syndrome) is a clinically recognisable syndrome with an incidence in newborns of 0-01 % (Jacobs et al., 1974). In most instances, it results from nondisjunction in a maternal or paternal gamete producing three normal No. 18 chromosomes in the zygote. Muller et al. (1972) described a case with the phenotype of trisomy 18 which had only one No. 18 chromosome and two metacentric chromosomes of different sizes. After autoradiography, the larger of the two was interpreted as being composed of two long arms of chromosome No. 18. The smaller metacentric chromosome was assumed to be equivalent to two short arms of chromosome No. 18. A similar case is presented here in which G and C banding were used to confirm the identity of the isochromosomes involved.

Case report

CLINICAL FINDINGS
The proposita (Fig. 1) was first seen as a 7-day-old infant born to a 23-year-old mother and a 28-year-old father who were not related. She was the product of a second pregnancy, the first having ended in spontaneous abortion. Delivery followed a term pregnancy which was complicated by the cord being wrapped around the neck. Crying was delayed because 'increased mucus' and respiratory distress required administration of oxygen for approximately 10 hours after birth. Birthweight was 2727 g and body length was 49.5 cm. Head circumference was 34 cm and chest 30 cm. The baby had difficulty feeding during the first 5 days.

PHYSICAL EXAMINATION AT BIRTH
Physical examination revealed a 'staring appearance', low set ears, very small mouth, micrognathia, and short neck. There was a poor Moro's reflex, weak cry, no rooting reflex, poor grasp, and fair sucking instinct. Genitalia were small with gaping minor and major labia.

Extremities revealed rockerbottom feet and limited abduction at both hip joints (questionable subluxation). There was an overlapping of the forefinger and ring finger over the middle finger and a short dorsi-flexed big toe. No simian lines were present. A faint systolic murmur was heard at the pulmonary area and borderline cardiomegaly was seen on x-ray examination.

Laboratory tests revealed a haemoglobin of 16.4 g/dl, bilirubin of 114±6 mmol/l (6-7 mg/100 ml) total and 3.42 mmol/l (0.2 mg/100 ml) direct, sodium of 147 mmol/l, and potassium of 3.1 mmol/l. Urinalysis results were normal except for 3 to 4 RBC/hpf.

SUBSEQUENT PHYSICAL DATA
The patient was seen at 1 year, at which time the karyotypes were repeated and photographs taken. On her most recent visit at the age of 17 months, the patient was doing remarkably well. Weight at this time was 6556 g, length 73.0 cm, and head circumference 44.6 cm. All formula feedings were by the gavage route but solids were taken well from a spoon. Vision and