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A PATIENT WITH SCHINZEL-GIEDION SYNDROME AND A REVIEW OF 20 PATIENTS

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Summary The Schinzel-Giedion syndrome is characterized by severe midface retraction, multiple skull anomalies, clubfeet, and cardian and renal malformations. So far, 20 patients have been reported. This is the first report of the syndrome demonstrated in Oriental patients. In surviving patients, severe growth and developmental deficiency is a common finding.

Key Words Schinzel-Giedion syndrome, congenital hydronephrosis, multiple congenital anomaly syndrome

INTRODUCTION

In 1978, Schinzel and Giedion (1978) described a new syndrome with severe midface retraction, multiple skull anomalies, clubfeet, and cardiac and renal malformations in sibs. So far 20 patients with the Schinzel-Giedion syndrome have been reported (Donnai and Harris, 1979; Kelley *et al.*, 1982; Burck, 1982; Saal *et al.*, 1989; Pul *et al.*, 1990; Al-Gazali *et al.*, 1990; Maclennan *et al.*, 1991; Robin *et al.*, 1993; Verloes *et al.*, 1993; Herman *et al.*, 1993; Labrune *et al.*, 1994). We report a new patient with the Schinzel-Giedion syndrome and a review of the literature on the subject.

CLINICAL REPORT

The patient is a female newborn infant who was born at term as the second child to non-consanguinous healthy Japanese parents. Fetal ultrasonography revealed congenital hydronephrosis and oligohydroamnios. At term, her birth

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weight was 2,638 g, body length 45 cm, and head circumference 32.5 cm. Apgar scores were 7 and 7 at 1 and 5 min, respectively. The hospital course was complicated by poor feeding, apneic attacks and cardiac failure. Echocadiography revealed dysplastic tricuspid valves, tricuspid insufficiency, ASD and VSD. Abdominal ultrasonography showed left hydronephrosis and hydroureter.

At age 6 months, examination showed coarse dysmorphic features which included a wide anterior fontanel and sutures, frontal bossing, midface retraction, depressed nasal bridge, short upturned bulbous nose, submucosal cleft palate, deep set eyes, characteristic deep grooves under the eyes, short neck (Fig. 1a), and hyperconvex nails. She had a narrow thorax, remarkable abdominal distension and bilateral talipes equinovarus (Fig. 1b).

Radiographic examinations revealed widely patent anterior fontanel and sutures, a sclerotic skull base, a steep base of the skull, broad ribs and a hypoplastic

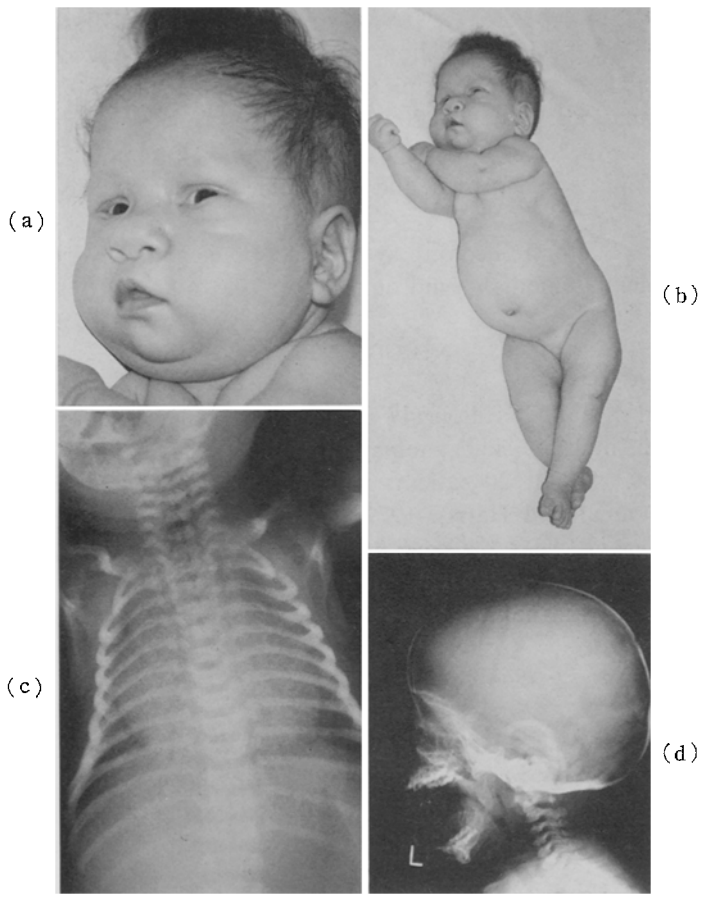

Fig. 1. a, Coarse dysmorphic features. b, Narrow thorax and distended abdomen. c, d, Chest and skull X-rays.

thorax (Figs. 1c and d). The pubic bones were hypoplastic. Mild widening of the distal femora and hypoplastic distal phalanges were noted. Screening for metabolic abnormalities was negative. Her karyotype was 46,XX.

She was floppy and head control was established at the age of 8 months. Her foot joints were spastic and she could not sit alone or crawl at the age of 14 months. Her weight was 8,900 g (−0.4 SD), body length 70.7 cm (−2.1 SD), and head circumference 44 cm (−1 SD).

DISCUSSION

The Schinzel-Giedion syndrome is a newly described multiple congenital anomaly syndrome. Twenty patients have been reported (Table 1). This syndrome is characterized by dysmorphic facial appearance, urogenital anomalies, cardiac anomalies, and generalized skeletal dysplasia. Intrauterine growth is normal. Midfacial hypoplasia with a coarse appearance and deep grooves under the eyes are clues to diagnosis. Verloes *et al.* (1993) described the face as a figure '8' shape. They observed changing craniofacial abnormalities: hirsutism vanishes, midface retraction becomes less prominent, and bitemporal narrowing more obvious.

Some patients have anomalies in the central nervous system. Maclennan *et al.* (1991) described a case with increasing ventriculomegaly, intraventricular bands, and subependymal pseudocysts on neurosonography. Robin *et al.* (1993) found generalized atrophy, hypoplasia of the basal ganglia, atrophic corpus callosum, and hypoplastic pons on MRI.

Bilateral or unilateral hydronephrosis is an important clue to diagnosis. Prenatal detection may be possible. Some patients have stenosis of the ureteropelvic junction or vesicoureteral reflux. Genital anomalies in female patients include deep interlabial sulcus, hypoplasia of labia majora or minora, hymenal atresia and short perineum. In males, hypospadias, hypoplastic scrotum and short penis are often seen (Al-Gazali *et al.*, 1990).

Radiographic studies of the skeleton are imperative in this syndrome. The skull base is steep and shows sclerotic change. Poorly mineralized cranium, wide occipital synchondrosis, widely patent anterior fontanelle, and wormian bones are found. Other features are broad ribs, hypoplastic pubic bones, thick long bones diaphyses, widening of distal femora, tibial bowing, hypoplasia of distal phalanges in hands and feet and short first metacarpals.

Complications of hepatoblastoma (Burck, 1982) and malignant sacrococcygeal teratoma (Robin *et al.*, 1993) were reported. An increased incidence of embryonic tumors might be a component of the Schinzel-Giedion syndrome (Robin *et al.*, 1993).

The basic defect of this syndrome is unknown. Autosomal recessive inheritance seems to be plausible. Further studies are necessary to elucidate the nature of this syndrome.

Table 1. Frequency of features.

Findings	Total cases	This case	Findings	Total cases	This case
General features			Major anomalies		
Gender (M:F)	10 : 10	F	Cardiac anomaly	7/17	+
Neonatal asphyxia, ventilation	7/10	+	Hydronephrosis, hydroureter	17/19	+
Growth retardation	13/13	+	Deep sulcus between major and minor	10/10	+
Mental retardation	15/15	+	labia, hymenal atresia, short perineum		
Epilepsy	15/17	−	Hypospadias, short penis	6/6	
Apneic spell	4/5	+	CNS anomalies, brain atrophy	6/14	−
Spasticity	9/10	+	Postaxial polydactyly	2/18	−
Neoplasm	2		Talipes	10/18	+
Death before 2 years	8		Radiologic findings		
Facial appearances			Wide occipital synchondrosis	11/15	+
Midface hypoplasia	19/19	+	Sclerotic base of the skull	14/16	+
Coarse face	20/20	+	Steep base of the skull	11/15	+
High protruding forehead	18/18	+	Multiple wormian bones	9/13	−
Wide sutures and fontanels	18/18	+	Long clavicles	8/9	−
Hypertelorism	16/16	+	Hypoplastic first ribs	3/6	−
Deep groove under the eyes	12/14	+	Broad ribs	15/16	+
Saddle nose with retracted root,	16/18	+	Hypoplasia of pubic bones	9/16	+
upturned nose			Thick long bones diaphyses	8/14	+
Choanal stenosis	5/17	−	Widening of distal femora	5/9	+
Low set ears	14/16	+	Tibial bowing	6/10	+
Short neck with abundant skin	17/17	+	Hypoplasia of distal phalanges	8/14	+
Facial hemangiomata	3/17	−	in hands and feet		
Cutaneous manifestations			Mesomelic brachymelia	8/16	+
Hypertrichosis	14/18	+	Short first metacarpals	6/11	−
Hyperconvex nails	10/13	+			
Hypoplastic nipples	3/4	+			
Hypoplastic dermal ridges	10/10	+			
Simian creases	10/10	+			

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