Case Report

Rhizomelic limb shortness and abnormal facies: short stature syndrome sharing some manifestations with robinow syndrome

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ABSTRACT

In children, short stature and disproportionate skeletal growth are associated with many syndromes and these syndromes have characteristic radiological changes which help in their diagnosis. However, many of them have no well-defined diagnostic criteria, and thus overlap between apparently distinct syndromes is common. Here, we report a child with characteristic features seen distinct from any other dwarfing syndrome known to us with some of the features similar to Robinow syndrome. Newborn had a broad and prominent forehead, mid-face hypoplasia, hypertelorism, flat nasal bridge, upturned nose, elongated philtrum, protruding tongue, single crease in the left hand, widely spaced nipple, brachydactyly in lower limbs, and disproportionately short rhizomelic upper and lower limbs. Based on these features, a diagnosis of Robinow syndrome was made. The case was the first of his kind admitted to our institute. The diagnosis was made clinically after follow-up.

Keywords: Autosomal dominant, Facial dysmorphism, Short stature, Rhizomelia, Robinow syndrome

Disproportionate short stature in a child needs evaluation. Evaluation of short stature at a genetic clinic in northern India reported skeletal dysplasia in 32.1% of the children [1]. Diagnosis in these children is mainly made from clinical features, anthropometric analysis, and regular follow-up. Robinow syndrome is an extremely rare genetic disorder affecting many parts of the body. First described by Robinow *et al*. in 1969, this syndrome has variable clinical and radiological features. It includes short-limbed dwarfism, abnormalities in the head, face, and external genitalia, and vertebral defects [2-4]. This disorder exists in both dominant and recessive patterns with varied presentations. Patients with dominant patterns exhibit moderate symptoms and more physical characteristics and skeletal abnormalities are seen in the recessive group. The syndrome is also known as Robinow-Silverman-Smith syndrome, Robinow dwarfism, fetal face, fetal face syndrome, fetal facies syndrome [5].

Here, we present the case report of a child with Robinow syndrome with rhizomelic limbs which is rarely seen.

CASE REPORT

A male newborn weighing 1500 g was born at gestation 34^{+4} weeks to a 21-year-old primigravida by preterm vaginal delivery with APGAR scores of 7 and 8 at 1 and 5 min of life respectively. The baby was a product of a non-consanguineous marriage. Newborn developed respiratory distress soon after birth and in view of low birth weight and distress, the baby was shifted to the sick newborn care unit. The mother had a history of leakage for 2 days prior to birth, thus in view of the high perinatal score, empirical antibiotics (Injection ampicillin/gentamycin) in recommended dosages were started.

On examination, the newborn had a head circumference of 29.8 cm with a length of 30.8 cm. Newborn had a broad and prominent forehead, mid-face hypoplasia, hypertelorism, flat nasal bridge, upturned nose, elongated philtrum, and protruding tongue. Newborn had a single crease in the left hand, widely spaced nipples, brachydactyly in lower limbs, and the chest were small as compared to the abdomen. The newborn had disproportionately short rhizomelic upper and lower limbs (Fig. 1). On auscultation, pansystolic murmur was heard.

Echocardiography revealed muscular type ventricular septal defect of size 4mm. Neurosonogram and ultrasound kidney were normal (Fig. 2). Respiratory distress settled in 48 h and the newborn received antibiotics for 7 days and was discharged. Complete blood count, blood culture, renal function tests, metabolic profile, thyroid function tests were sent for investigation and were found normal (Table 1). Karyotyping showed a normal 46XY chromosome. The child was followed up at 3 and 6 months of life.

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At further follow-up, the child was of 6 months of age and had marked rhizomelic upper and lower limbs (Fig. 3). His growth data are summarized in Table 2. The child had similar facial features as before. The child had normal developmental growth for his age. In cardiovascular system examination, murmur had disappeared. Skeletal X-rays were done and revealed a dome-shaped thorax. X-ray spine was normal. Ultrasonography of the kidney and abdomen were normal.

DISCUSSION

The robinow syndrome is a rare variant of mesomelic dwarfism with dysmorphic characteristics but no identifiable biochemical or cytogenetic markers [6,7]. It has an incidence of 1:500 000 with a 1:1 male-to-female ratio [5]. Robinow *et al*. described children with mesomelic limb shortening, hypertelorism, and hypoplastic genitalia in 1969 [3-6]. The genes for the autosomal recessive Robinow syndrome were mapped to chromosome 9q22. The tyrosine kinase-like orphan receptor 2, ROR2 gene was also located in this region, and heterozygous mutations in ROR2 is been linked to the autosomal dominant condition brachydactyly type B. ROR2 is a member of the ROR family of receptor tyrosine kinases [4,5,7-9].

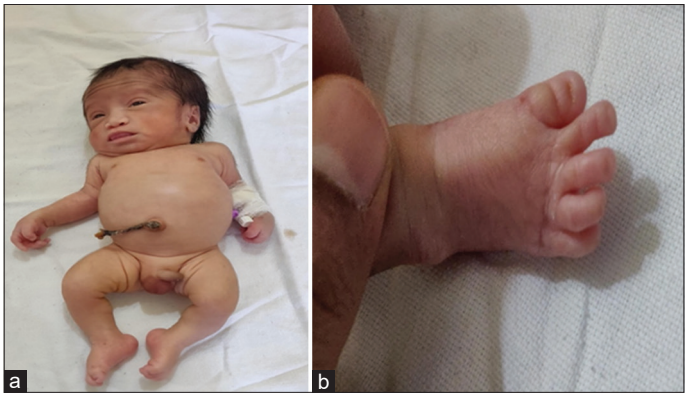

Figure 1: (a) Showing facial features, brachydactly and (b) rhizomelic limbs at birth

Differential diagnoses of rhizomelic limb shortness include achondroplasia, osteogenesis imperfecta, rhizomelia chondrodysplasia, rhizomelic limb shortness with a dysmorphic feature, and very rarely Robinow syndrome [10]. Our case report differs from all of these on clinical findings. The only syndrome which bears any resemblance to our case is Robinow syndrome.

The facial features in Robinow syndrome are distinct with hypertelorism, midfacial hypoplasia, short upturned nose with flat nasal bridge, broad, and prominent forehead. These are also called fetal facies based on relatively small face, laterally displaced eyes, and forward-pointing alae nasi. This appearance becomes less marked with time. The significant oral features which are distinctive and abet in the diagnosis are tented or downturned upper lip to an inverted V appearance with an indentation in the center. Ankyloglossia is also a feature and when prominent, may appear as a bifid tongue. The eye appears prominent due to the deficiency of the lower eyelid and resembles exophthalmos but varies since they do not protrude from the orbit. Low set ears with or without deformation of the pinna is yet another feature. Seldom occurrence of midline capillary hemangioma may be seen [4,6,11]. In most skeletal dysplasias with dwarfism, the limb shortening is rhizomelic. In Robinow syndrome, the limb shortening is usually mesomelic or acromesomelic. Five case reports have been published with rhizomela [12] Brachydactyly with shortening of the distal phalanx and nail hypoplasia or dystrophy, displaced or bifid thumb, incomplete cutaneous syndactyly of hands and feet, reduced stature, macrocephaly are features of this syndrome. The dermatoglyphic pattern unveils underlying maldevelopment of the hands with absent interphalangeal creases, bilateral transverse creases, proximal flexion crease of the little fingers, and a hypothenar whorl pattern [1,4,6]. Findings consistent with our case include relative macrocephaly, short nose, macrostomia with down-turned corners of the mouth, brachydactyly.

These children are usually prone to infection [12]. Our index case had a pansystolic murmur of ventricular septal defect heard at birth, but it was not so prominent on follow-up. Congenital heart abnormalities such as the atrial septal defect,

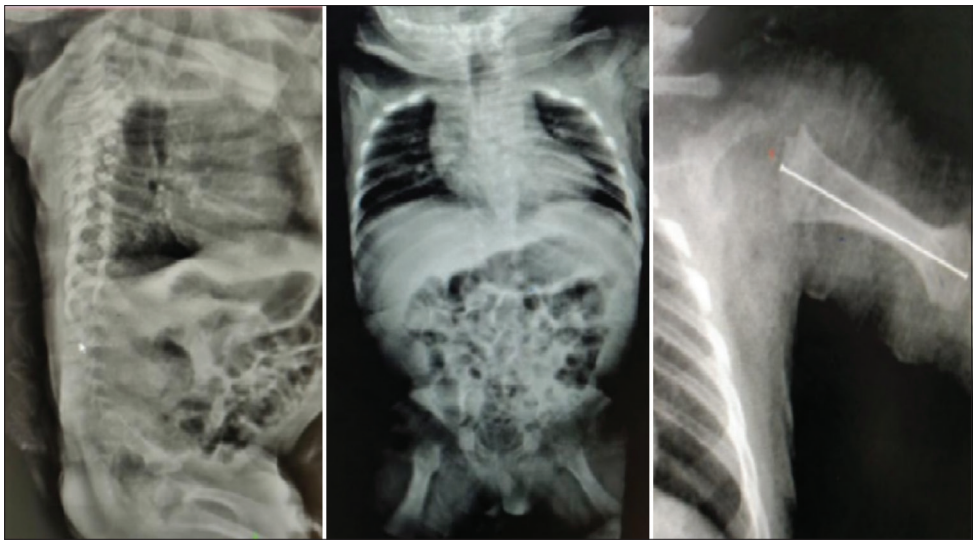

Figure 2: Showing normal thorax, spine and rhizomelia in both upper and lower limbs

Table 1: Investigations at various days of life

	Hemoglobin (g/dl)	Total leucocyte count/Absolute Neutrophil Count (per mm^3)	C-Reactive Protein (mg/L)	Platelet count (per mm^3)	Blood Urea Nitrogen/Serum Creatinine (mg/dl)	Cerebrospinal Fluid
Day 1	19.5	20100/6400	6-12	125000	21/0.9	Cells-30 Protein -130
Day 3	16.5	11000/4300	6	100000		
Day 7	13.6	11000/5600	6	153000	19/1.2	

Table 2: Showing growth parameters at follow ups

Age	Birth	3 months	6 months
Head circumference(cm)	29.8	34.3	37.2
Length (cm)	30.8	36.5	41.0
Weight (kgs)	1.500	2.7 kg	4.9 kg
Upper segment: Lower segment	22:7.8	25:9.4	30.5:10.5

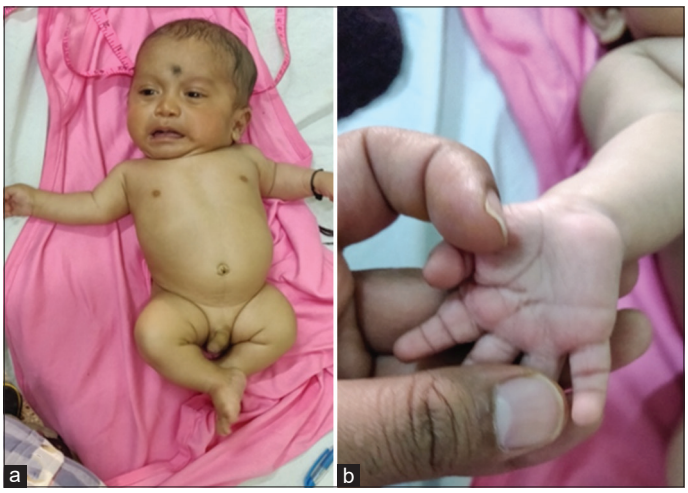

Figure 3: Infant on (a) 3 months and (b) 6 months follow-up

ventricular septal defect, coarctation of the aorta, tetralogy of Fallot, severe pulmonary stenosis or atresia, and tricuspid atresia and right ventricular outflow obstruction have been reported, commonest abnormality being pulmonary stenosis or atresia. These cardiac defects are the major cause of mortality in the 1st years of life [4,9].

Endocrine abnormalities along with genital abnormalities may be noted at birth and in some cases may cause concern regarding gender assignment at birth. In females, the anatomical defect is seldom obvious with reduced clitoral size and hypoplasia of the labia minora. In males, micropenis can occur with normal scrotum and testes [13]. Our child did not have these abnormalities.

Our patient has no hemivertebrae but according to reports, vertebral anomalies are seen in about 66% of cases [14]. Nevertheless, this case is outstanding for the lack of distinguishing radiological abnormalities. The marked prenatal onset of growth delay and extremely short stature are not common in Robinow syndrome. Thus, a positive diagnosis may be possible only at a later stage as craniofacial and skeletal changes evolve. Kyphoscoliosis and chest deformity can be seen due to widespread fusion of thoracic vertebrae with frequent hemivertebrae. Costovertebral segmentation defect could occur in severity in the thoracic part of the column and involving all vertebrae exhibiting as butterfly vertebrae, hemivertebra, and vertebral fusion [15]. The pedigree status of this case is not helpful since she is at present the only child of consanguineous parents. There is evidence for both dominant [4] and autosomal recessive inheritance [14] in Robinow syndrome.

The characteristic clinical dysmorphic features pave an easy way to diagnose recessive Robinow syndrome, in contrast to the dominant Robinow syndrome, in lack of mesomelia, and therefore other syndromes that go along with similar facial dysmorphic features (especially hypertelorism) and genital hypoplasia, such as Aarskog syndrome and Opitz G syndrome can be thought of as a differential diagnosis [9]. Despite its rare occurrence, the prevalence is lower due to infant or early childhood mortality [6,7,10]. Hence, a detailed cardiac assessment is necessary, especially if the parents are among the highly consanguineous population [4].

CONCLUSION

Robinow syndrome is a very rare syndrome. Usually, it can be diagnosed early with characteristic facial features, mesomelic shortening of limbs, genital features, and radiological features. Rhizomelic shortening can also be seen in this syndrome.

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