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CASE REPORT

A CASE REPORT OF LATE SURVIVAL IN ELLIS: VAN CREVELD SYNDROME

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ABSTRACT: Ellis–van Creveld syndrome (EVC) is an autosomal recessive disorder characterized by chondro-dystrophy, polydactyly, ectodermal dysplasia, and cardiac anomalies. Acromelic shortening of upper and lower limbs, genu valgum, multiple frenula, deformed teeth, short ribs and narrow thorax and congenital heart diseases complete the picture. The patients with the syndrome rarely survive into adulthood. Here, we report a lady with EVC presenting for the first time in middle age.
KEYWORDS: Ellis–van Creveld syndrome, Ciliopathy, Short rib narrow thorax syndromes.

INTRODUCTION: Ellis–van Creveld syndrome (EVC) is a rare short limbed disproportionate dwarfism characterized by postaxial polydactyly, several skeletal, oral, mucosal and dental anomalies, nail dysplasia and presence of congenital cardiac defects. The syndrome, also known as chondro-ectodermal dysplasia, is an autosomal recessive disorder with mutations of the EVC-1 and EVC-2 genes located on chromosome 4P16.[1]

The first full description of the syndrome was given by Richard Ellis and Simon Van Creveld in 1940.[2] A large number of cases have been reported in the Amish Community of Lancaster, Pennsylvania, USA, by McKuisk in 1964.3 Subsequently, the disease has been described in other population and is known to affect all races. The syndrome is characterized by high mortality in early life, with 50% of deaths occurring during infancy.4 Here, we report a case of EVC who presented for the first time at 47 years of age.

CASE REPORT: A 47-year-old female presented with progressive shortness of breath since adolescence (Class-III NYHA). There was no history of consanguinity in parents. The patient had one sibling who died at the age of 10 years; the cause of death was not known. On examination, the patient had short stature with a height of 130 cm (Fig. 1) Examination revealed six digits in each hand (x-rays are shown in (Fig. 4)

The distal and middle segments of hands and feet were short. Clinodactyly of fifth fingers were present (Fig. 2). The nails were hypoplastic and dystrophic. There was widened space between hallux and the rest of the toes. Genu valgum was present. (Fig. 1) The patient was a school dropout but had normal psychomotor and cognitive development.

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Fig. 1: Profile of the patient showing short stature and genu valgum.

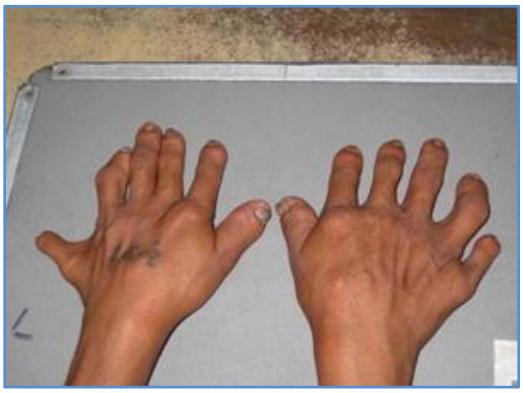


Fig. 2: Clinodactyly of fifth fingers of both hands

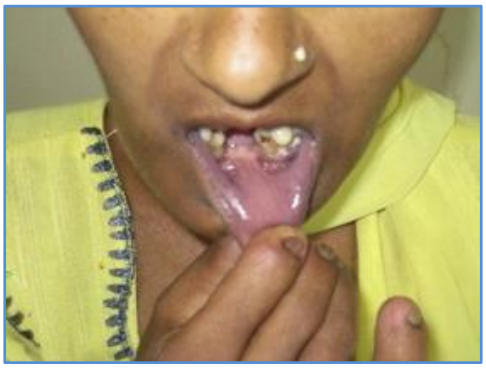
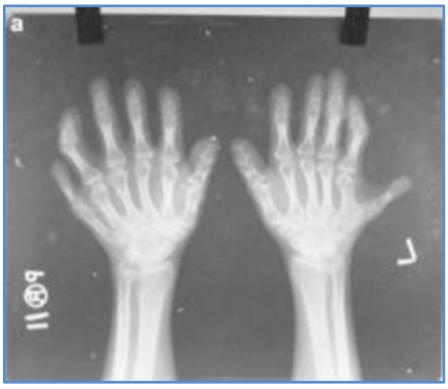


Fig. 3: Multiple labial frenula



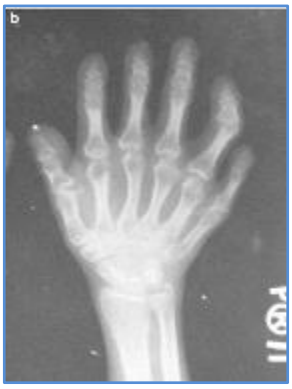


Fig. 4a and b: X-ray of wrist joint showing fusion of carpal bones and polydactyly

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The oral examination revealed multiple labial frenula in relation to lower lip (Fig. 3) there was a single, hyperplastic frenulum in relation to upper lip. The canine teeth of both the arches were deformed and hypoplastic. There were no incisor teeth. She was cyanosed (oxygen saturation = 80%). The jugular venous pulse (JVP) revealed prominent 'a' wave. The patient had long and narrow appearing thorax with a precordial bulge.

There was cardiomegaly, with apex beat at left 6th intercostal space, 3 cm lateral to the mid-clavicular line. Grade III/III parasternal heave was present. The first heart sound was loud; the second sound was widely split and fixed. The pulmonary component was loud. There was a grade 2/6 ejection systolic murmur at left second intercostal space and a grade 3/6 pansystolic murmur with inspiratory accentuation was audible at left lower sternal border. No flow rumble was present.

The ECG showed p-wave axis shifted to 30°. The mean frontal QRS axis was −75° with evidence of right ventricular hypertrophy in precordial leads. Chest X-ray revealed moderate cardiomegaly (CT ration = 65%) with evidence of right atrial enlargement. Ultrasound of abdomen revealed no abnormality.

Echocardiographic examination revealed situs solitus with enlarged right ventricle. A common atrial chamber was identified without any interatrial septum (Fig. 5). The right and left components of the common AV valves were at the same place with evidence of regurgitation through both the components of the valve. There was evidence of pulmonary arterial hypertension (PAH) in forms of right ventriculo-atrial gradient of 125 mmHg. A diagnosis of common atrium with PAH was made.

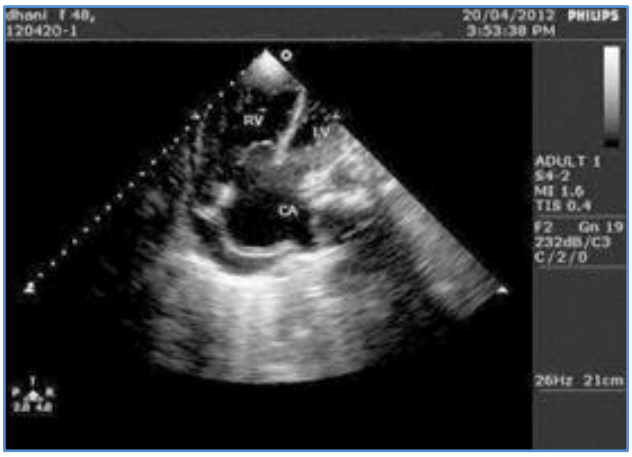

Fig. 5: Echo picture showing common atrium and pericardial effusion (apical-4 chamber view)

DISCUSSION: The classic tetrad of Ellis–van Creveld (EVC) syndrome consists of chondrodystrophy, polydactyl, ectodermal dysplasia, and cardiac anomalies. The incidence of EVC in general population is very low.[1] The prevalence of the disease varies widely in general population of 1 in 60,000 live births in USA to 1 in 150,000 live birth in European countries.[5] The syndrome is most prevalent in the Amish population of USA and Arabs of Gaza Strip, where a prevalence of 1 in 1000 live births has been reported.[5]

It is an autosomal recessive disorder with parental consanguinity present in 30% of cases.[1]

Recently, the syndrome has been included in a new class of human genetic disorders called 'Ciliopathies', where the underlying defect may be dysfunctional molecular mechanism in the primary cilia of cells.[6] The phenotype of the syndrome is variable and affects multiple organs.

In the present case, acromesomelia (relative shortening of distal and middle segments of the limbs), short stature, postaxial polydactyly of hands, hypoplastic and deformed nails and toes, and multiple frenula of lower lip were present. The patient had congenital heart disease in form of common atrium. The syndrome is characterized by high mortality in infancy and early life because of severe restriction imposed by short ribs and narrow thorax.[4]

Presence of congenital heart diseases like common atrium, AV canal defect and VSD also contribute to early morality. 33% can die in infancy or at an early age because of cardiorespiratory problems.[7] Few adults with EVC have been reported in the literature. Desilva EO reported 15 cases of EVC in an inbred family, where the eldest person was 82 years old.[8] Rudnik-Schoneborn et al described about 2 patients with EVC syndrome who were 18 and 30 years old respectively.[9]

Verbeek et al summarized growth data of 101 patients with EVC syndrome, including 10 patients above 20 years of age.[10] Graziadio et al reported about a patient with EVC syndrome who was 22 years old and had Type-1 diabetes.[11] While cases of EVC syndrome have been reported from India, no case with survival into late adulthood has been reported so far. EVC needs to be distinguished from a number of closely related entities.

Weyer's acrofacial dystosis is an autosomal dominant condition with many clinical features similar to EVC. However, the patients are often of normal stature and cardiac defects and thoracic dysplasia are absent. 8 Jeune syndrome, another related disorder, is an autosomal recessive condition characterized by small chest, renal anomalies and retinal degeneration. 12 Cardiac defects are seldom present. Usually, such patients do not survive beyond infancy.

CONCLUSIONS: A case has been reported here with classic features of Ellis–van Creveld syndrome who presented late in life with little complication during infancy and adolescence. Several cases of EVC have been reported from India. To our knowledge, this is the first report of EVC from India presenting in middle age. Survival up to late adulthood is exceptional in case of EVC.

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