INTRODUCTION

Focal dermal hypoplasia or Goltz syndrome is a rare genodermatosis characterized by multiple abnormalities of ectodermal and mesodermal origin. It is found predominantly in females and is characterized by hypoplasia of the skin and papillomas. There is congenital skin hypoplasia, which might be extensive and often involves the scalp. The skin lesions are often bilateral but asymmetrical over both lower limbs, initially red in colour, patchy and of different shapes and sizes. Later, fat might herniate through the areas of atrophy. In addition there are often areas of linear or reticular hyper- or hypopigmentation. Papillomas develop around the lips, gums or the side of the nose. Scalp hair may be sparse or brittle and the nails are frequently dysplastic. The limb defects include syndactyly of fingers 3 and 4, polydactyly, or hypoplasia of a limb. The eyes are also frequently affected, mostly asymmetrically, with choro-retinal or iris colobomata, but unilateral anophthalmos has been reported. Microcephaly and retardation are frequent.\(^1,2\)

This report documents the classical phenotypic features and the additional limb deformities of this rare syndrome.

CASE REPORT

The patient was referred to the Department of Orthopaedics at the age of 6-months for clinical assessment because of her ectrodactyly and oligodactyly. She was product of an uneventful gestation. At birth her weight, length and head circumference (OFC) were around the 10th percentile. The mother was 35 years of age with history of multiple spontaneous abortions and male stillbirths. Parents were related.

Clinical examination showed growth around the 10th percentile. Very sparse hair, sparse eye lashes and eye brows, pugilistic facies, deeply-seated anophthalmic eyes, and apparently outstanding bulging ears, microstomia with high vault palate with no clefting were present (Figure 1). Ophthalmological examination showed no associated choro-retinal or iris colobomata. The neck showed skin folds with wrinkling. The skin markings were characteristic of skin hypoplasia which was extensive and involved the scalp. The skin lesions were bilateral but asymmetrical over the limbs. They were initially red in colour, patchy and of different shapes and sizes alternating with areas of skin atrophy. Areas of linear hyperpigmentation and hypopigmentations along the axilla and patches of hypopigmentations all over the trunk were noted. Neurological examination as well as

ABSTRACT

We report on a-6-months-old girl who manifested the phenotypic features of focal dermal hypoplasia. Significant limb deformities in connection with typical skin changes were documented. The family history had a high frequency of spontaneous abortions and male stillbirths. Male stillbirths are a landmark in favour of X-linked dominant pattern of inheritance. Despite the severe hand/foot deformities, the skull base and the tubular bones were sclerotic.

Key words: Focal dermal hypoplasia. Split hand/split foot. Radiology.

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Figure 1: Proband at age of 6 months: Note the facial dysmorphism, sparse hair, faint eye lashes and eye brows, large protruding ears, the massive ectrodactyly and the oligodactyly, umbilical hernia, the warty verrucous eruption in the axilla.

Figure 2: Anteroposterior hand radiograph showed oligodactyly with preservation of the proximally situated thumb and preservation of the 4th and 5th fingers only, associated with bone sclerosis.
hearing and vision were normal. Developmental assessment showed normal motor development; she could sit without support and roll over easily. Coordination was reasonable despite the split hand deformity.

On radiological skeletal survey, the skull showed marked demineralization of the vault and hyperostosis of the base of the skull. Limbs showed ectrodactyly (lobster claw right hand and both feet). The right hand radiograph showed oligodactyly with preservation of the thumb, index and distal dysplasia of the 5th finger (Figure 2). Foot radiograph showed marked ectrodactyly of the toes (total aplasia of the 3rd, 4th and 5th toes for the right foot with partial preservation of the 1st and 5th toes only) and bone sclerosis.

Abdominal ultrasound revealed no abnormality and transfontanelle echography was normal. The child and her parents underwent chromosomal study, which revealed normal results. Metabolic disturbances were also ruled out and other biochemical tests were normal.

**DISCUSSION**

Most cases of patients with Goltz syndrome are female and inheritance is thought to be X-linked dominant with early intrauterine lethality in males. There have been several reports describe the extent of the malformation complex in association with cytogenetic analyses in families with Goltz syndrome.3-5 The association of skin markings with the complexity of the limb congenital malformation compatible with hypomelanosis of Ito (incontinentia pigmenti achromians), ectodermal dysplasias, particularly EEC syndrome; the latter is in contrast to autosomal dominant and autosomal recessive patterns of inheritance. Nonetheless this patient manifested the association of specific skin markings with the complexity of the limb malformation compatible with Goltz syndrome.

The molecular defect of Goltz syndrome has been described in correlation with PORCN gene mutations that lead to a developmental disorder affecting skin, bone, eyes and other body systems. Bornholdt et al. described the molecular characterization of 24 unrelated patients from different ethnic backgrounds revealed 23 different mutations of the PORCN gene in Xp11.23,10 Three were microdeletions eliminating PORCN and encompassing neighboring genes such as EBP, the gene associated with Conradi-Hünermann-Happle syndrome (CDPX2). Twelve out of 24 patients carried nonsense mutations resulting in loss of function. They concluded that Goltz syndrome represents a developmental defect with focal distribution of affected tissues due to block of Wnt signal transmission from cells carrying a detrimental PORCN mutation on an active X-chromosome.

Limb defects have been categorized into various possible etiological subgroups, such as known teratogens (thalidomide), genetic factors as in Holt-Oram syndrome, VACTERL association, and maternal Diabetes mellitus. Split hand/split foot deformity can occur in association with skin manifestations as in hypomelanosis of Ito (incontinentia pigmenti achromians), ectodermal dysplasias, particularly EEC syndrome; the latter is in contrast to autosomal dominant and autosomal recessive patterns of inheritance. Nonetheless this patient manifested the association of specific skin markings with the complexity of the limb malformation compatible with Goltz syndrome.

**REFERENCES**


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