A CASE OF FOCAL HYPOPLASIA (GOLTZ'S SYNDROME) WITH REVIEW OF LITERATURE

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Summary

Focal dermal hypoplasia or Goltz's Syndrome is a mesoectodermal dysplasia that has been reported mostly in girls. It is characterized by linear hypoplasia of the skin with herniation of subcutaneous fat tissue as fawn coloured nodules, musculoskeletal disorders, ocular defects, dystrophic nails and defective dentition. The only definitive test for this condition to date is skin biopsy.

A typical case is reported together with a review of the literature.

Focal dermal hypoplasia (Goltz's Syndrome) is a separate clinical entity consisting of characteristic, multiple, distinctive developmental defects of the skin namely, linear areas of dermal hypoplasia, abnormal pigmentation and fawn-coloured nodules of adipose tissue due to herniation of subcutaneous fat in association with other congenital anomalies of musculoskeletal and central nervous systems, with ocular and dental manifestations. The less defined abnormalities such as shortness of stature and slightness of the build are also reported. A typical case of this entity, seen in our Department, is described below with a review of the literature.

Report of a Case

A 6 year old girl, the product of a full term pregnancy and uncomplicated normal delivery at home with low birth weight, was admitted in the Surgical Wards for the repair of umbilical hernia and was referred to the Department of Dermatology for the peculiar skin nodules and coccal infection of the scalp.

She is the second of the 3 off-springs of a non-consanguinous marriage. There are 2 male siblings and they are healthy at present. Mother gives history that the patient has an umbilical hernia from birth that has been increasing in size which has been operated. Her skin at birth showed reddish blebs and raw areas that lead to the present condition. Her growth and development were delayed than that of her other siblings; turning at 5th month, walking at 1 year 3 months and talking at 2 years.

General appearance showed slight build with thin limbs, bulging eyeballs without strabismus and large ears with forward protrusion of pinna of the left ear (lop ear). There is a tendency towards tower skull. Eye brows are scanty more on the right than on the left. She is of moderate nourishment weighing 10.5 Kgs. and 93.5 cms. in height.

The characteristic polymorphous areas of atrophy with ovular, grouped, and

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linear depressed defects with hyperpigmentation of intervening normal skin are present on the cheeks, below the angles of the eyes, shin, ears, neck, axillae, upper part of the chest, loins, on the back at the lumbosacral area, thighs and legs. The hair is sparse having patchy alopecia of the scalp. There is hypertrichosis on the back. The other significant cutaneous finding is fawn-coloured soft tissue tumors in bizarre and zosteriform distribution on the tip of the nose, ala nasi, chin, posterior aspect of the right upper limb from the posterior axillary line upto the elbow joint and anteriolateral aspect of the popliteal fossa. Hypo and hyper pigmentation over the extremities, axillae and trunk is noticeable. Both appear to be related to the linear defects of the skin. Telengiectasia is not present.

There is proximal syndactyly between 3rd and 4th fingers of the left hand, hypoplasia of the little finger, polydactyly and malformed little finger and proximally curved thumb. Hyponychia with thin, ridged dystrophic nails are present on all fingers of the hands. There is syndactyly between 3rd and 4th toes of right foot and 4th and 5th toes of left foot, and there is absence of great toe nail of left foot with dystrophic ridged thin nails of the rest of the toes. Dorsal aspect of both the feet showed papular lesions on the lateral aspect.

Clinical examination of heart, lungs and abdomen do not reveal any abnormality. Ophthalmological examination including fundus examination is normal. Cochleopalpebral and Cochleopupillary reflexes are present. Calorie test showed normal response on both sides. From the above findings it is inferred that the child's acuity of hearing is normal. No mental retardation is found. Dental examination has revealed well formed teeth with good opposition.

Routine urine analysis and complete blood count are within normal limits. The roentgenological examination of skull, vertebral column, chest are normal. Syndactyly and anomalous development of phalanges are seen in the hands of feet. X-Rays of hands showed skeletal immaturity. Radiologically right iliac wing is hypoplastic by measurement when compared to left.

Biopsy sections from fawn coloured tumor shows that epidermis is normal with flattened epidermal ridges. Some areas in the dermis have shown thin collagen bundle while in others it is very scanty such that the adipose tissue appears to be seen directly underneath the epidermis except for a strand or two of collagen. There are focal areas of endothelial cells, which show lumen as well as solid strands. The skin adnexae are absent.

Discussion

Focal dermal hypoplasia had been first recognised as a separate entity in 1962 by Goltz who published 3 cases. Although 48 documented cases were described in literature upto the end of 1970, the syndrome is probably not excessively rare since some of these cases were reported as poikiloderma congenital (Rothmund Thomson Syndrome), as atrophodermia liniaris maculosa et papillamotosis congenitalis, as naevus lipomatodes superficialis and under other diagnoses. It is postulated on the basis of limited genetic data that the focal dermal hypoplasia syndrome may be inherited as a X-linked dominant or autosomal dominant but sex limited.

Goltz's syndrome is a developmental anomaly with a broad spectrum of malformations of ectoderm and mesoderm. The characteristic atrophic polymorphous areas with ovular, grouped and linear depressed defects and the fawn-coloured tumors due to herniation of subcutaneous fat are characteristic of all cases including the present case. Angiofibromas of the body orifices are not present in our case and in world literature it occurred in 6 cases. Dystrophic nails

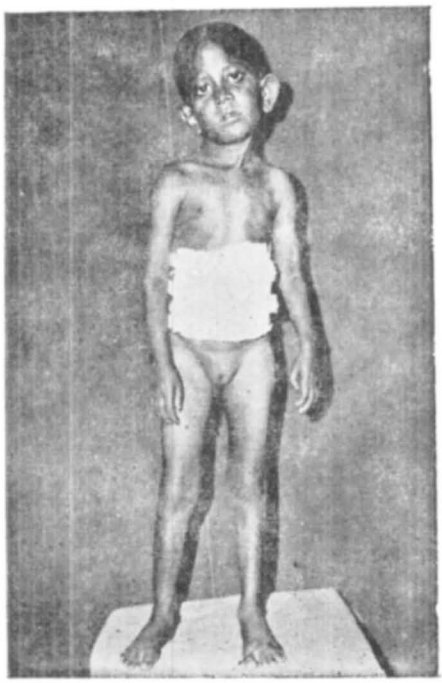

Fig. 1

Appearance of the six year old patient with short stature and slight build

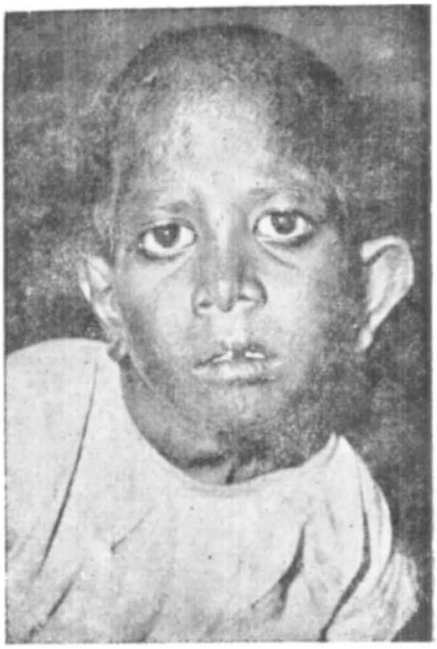

Fig. 2

Patient showing papular lesions on the nose and chin, protruding large ears and patchy alopecia

Fig. 3

Left arm showing linear fawn-coloured tumors and hypopigmented atrophic macules

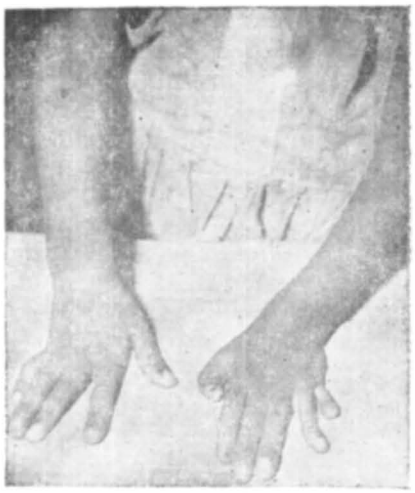

Fig. 4

Hands showing syndactyly and polydactyly

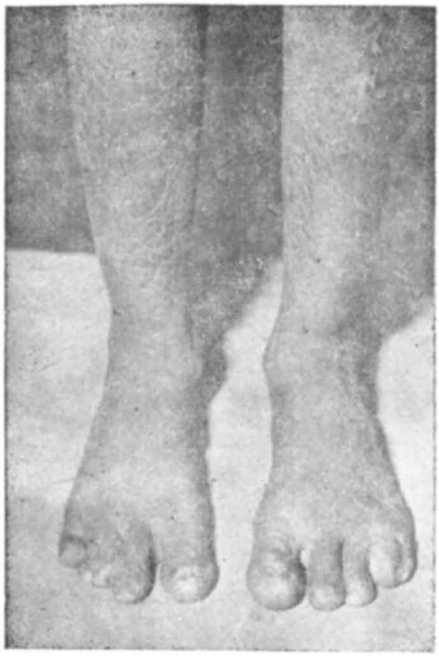

Fig. 5

Feet showing syndactyly and dystrophic thin nails

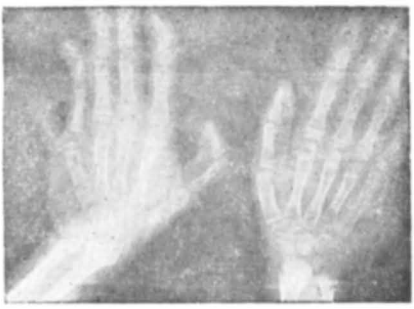

Fig. 6

X-Ray of the hands showing proximally curved left thumb, deformity of fifth finger, polydactyly and skeletal immaturity

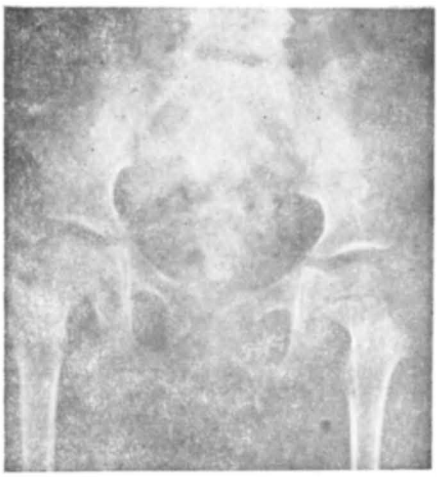

Fig. 7

X-Ray pelvis showing right iliac wing is hypoplastic by measurement when compared to the left

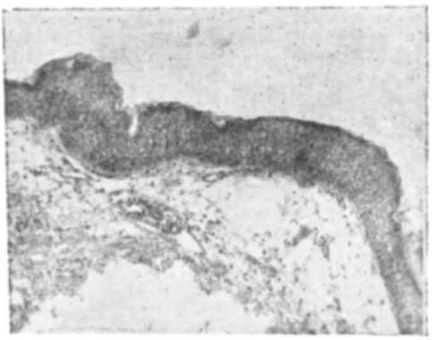

Fig. 8

Microphotograph showing normal epidermis, scanty collagen fibres adipose tissue immediately beneath the epidermis and vascular proliferation (H E x 200)

were present in majority of cases. In our case there is complete absence of nail of the left great toe, in addition to the dystrophy of the rest of the nails of the hands and feet. The common musculoskeletal abnormality reported has been syndactyly of both hands and feet and hypoplasia of phalanges in certain cases. In our case there is proximal syndactyly of left hand between 3rd and 4th fingers and complete syndactyly of 3rd and 4th toes of right foot and between 4th and 5th toes of the left foot. There is polydactyly of left hand, hypoplasia of the left hand little finger with malformed proximally curved thumb present in our case. Scoliosis which was described by Gallagher[1] and Holden[10] is not present in our case. Ocular manifestations are not noticed. Radiologically there is skeletal immaturity and hypoplasia of iliam present in our case. There is no hearing defect in this case which was described only in the case of Holden et al [10].

The differential diagnosis of Goltz's syndrome is not usually difficult for the simple reason of the multiple characteristic developmental defects of the ectoderm and mesoderm. The fawn-coloured skin tumors may be mistaken for naevus lipomatodes superficialis of Hoffman and Zurhalle, which is also characterised by the presence of neutral fat bearing cells in the Corium. The replacement of connective tissue by fat cells is by no means as extensive as in the focal dermal hypoplasia and clinically the lesions are entirely dissimilar consisting of grouped papules localized in the skin of the lower part of buttocks but showing no tendency for linear arrangement and usually not associated with other congenital abnormalities. Burn scars which superficially resemble the fawn-coloured tumors can easily be distinguished by close inspection and palpation.

The angiofibromas of the body orifice if present are to be differentiated from Verruca Vulgaris. The angiofibromas are red, rough surfaced and not sharply outlined as are warts.

The various linear hypoplastic lesions seen in the syndrome are to be differentiated from Poikiloderma congenitale (Rothmund Thomson Syndrome). This condition is characterised by flushing induration of the skin at 3–6 months, but sometimes as late as the 2nd year occuring notably on the cheeks, hands, feet and buttocks succeeded by varying combination of atrophy, telangiectasia, pigmentation and depigmentation and keratoses. Sometimes these changes resemble chronic radiodermatitis. Light sensitivity is a feature of many cases exposure to sunlight may extend the distribution of the eruption on to the upper trunk. Most patients show high familial occurrence, short stature with small hands, juvenile cataracts, absence or sparseness of hair of the eye brows and eye lashes and hypogonadism. If distinction is to be made between Rothmund Thomos Syndrome and focal dermal hypoplasia it apparently must rest on histological examination. Poikiloderma congenitale does not show hypoplasia of the collagen but rather is characterised by atrophy of the epidermis, disappearance of the papillae, hydropic degeneration of the basal cell layer and remarkable dyskeratosis of the epidermal cells followed by the appearance of outright carcinomas in many cases.

The question of a possible relationship between focal dermal hypoplasia and aplasia cutis congenita of skin of new borns comes into consideration. In aplasia cutis the denuded areas heal slowly, leaving ugly scars and at times need skin grafts due to complete failure to heal. This condition is of unknown cause, occurs sporadically and occasionally in families and is not associated with other congenital anomalies. In the third case of Goltz, focal dermal hypoplasia was associated with aplasia cutis on the thorax. Although occasional patients with focal dermal hypoplasia have had

disturbances of the sweating mechanism, confusion with anhidrotic and hyperhidrotic ectodermal dysplasia syndromes should not occur.

Focal dermal hypoplasia is somewhat suggestive of incontinentia pigmenti (Bloch Sulzberger syndrome) because of the linear distribution of lesions, and the apparent hyperpigmentation resulting from dermal hypoplasia and the onset of lesions at or shortly after birth. However by close inspection of the lesion, palpation of the defect in the corium and the absence of a premonitary bullous and subsequent two stages namely intermediate verrucous stage and last phase of pigmented macules arranged in bizarre whorls, bands or irregular lines and the complete different histological picture rules out the disease.

Scleroderma en coupe de sabre and idiopathic atrophoderma of Passini and Pierini also come into picture in differential diagnosis because of the linear distribution of the cutaneous lesions, but their late onset as well as quite different appearance and absence of associated musculoskeletal abnormalities rule out the difficulty in differential diagnosis.

Silver in his excellent treatise on Rothmund Thomson Syndrome discussed all the occulocutaneous disorders in brief and they come under differential diagnosis with focal dermal hypoplasia. They all have characteristically dysplasias of the ectodermal derivatives only except for the Ellis Von Creval Syndrome which has mesenchymal involvement also.

Howell in his article naevus angiolipomatosus vs focal dermal hypoplasia discusses that the fawn coloured fat tumors are not the herniations of subcutaneous adipose tissue but nevoid neoplasms (hamartomas) of the subcutaneous fat and justifies his explanation by saying that fat tissue appears to be associated with vascular proliferation in the papillary bodies and to crowed out the corium by downward infiltration of the newly formed fat. Secondly there is a definite stratum of dermis dividing the superficial fat and the normal subcutaneous fat.

Focal dermal hypoplasia has marked dysplasia of most of the ectodermal and mesodermal derivatives and hence is classified separately. Since Goltz described 5 cases in total and recognized the syndrome as a separate entity it is proper to use his name as the eponym.

Acknowledgment

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False

The beneficial effect of tetracyclines in acne vulgaris has now been attributed to a reduction in free fatty acid formation within the pilo sebaceous canal. A similar beneficial effect is not observed clinically with most of the other antibiotics possibly because they do not have any effect on the process of fatty acid reduction; but only helps to control secondary infection.

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