

## CONGENITAL POIKILODERMA WITH TRAUMATIC BULLA FORMATION, ANHIDROSIS, AND KERATODERMA

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**Abstract.** A 14-year-old boy with congenital poikiloderma had anhidrosis, palmoplantar-pitted keratoderma, traumatic bulla formation, and defective dentition, but no abnormalities of the hair, nails, or eyes. This patient was similar in some respects to others reported as having dermatopathia pigmentosa reticularis, the Franceschetti-Jadassohn syndrome, the Mendes da Costa syndrome, and acrokeratotic poikiloderma.

**Key words:** Dermatopathia pigmentosa reticularis; Franceschetti-Jadassohn syndrome; Mendes da Costa syndrome; Acrokeratotic poikiloderma; Autosomal-dominant disease; Defective dentition; Generalized poikiloderma

The syndromes of congenital poikiloderma or reticulated hyperpigmentation are an uncommon and confusing group of disorders. The Rothmund-Thomson syndrome, dyskeratosis congenita, and incontinentia pigmenti are well known to most dermatologists and are common enough to be defined as distinct entities. Many other congenital poikilodermas have been reported, however. These cases are often so rare that it is difficult to determine which cases do and which do not represent distinct clinical syndromes. Recently, we saw a patient with congenital poikiloderma whose disorder emphasizes these difficulties of classification.

### CASE REPORT

The patient was the product of an apparently normal pregnancy. He appeared to be normal at birth. He was adopted at 5 days of age, and the adoptive parents knew little about the patient's biological mother, except that she was 14 years old and healthy.

Recurrent traumatic bullae of the distal extremities became increasingly frequent during infancy. The nails and hair developed normally, but dentition was delayed and defective. The patient's developmental milestones were normal.

By 2½ years of age, he had developed malar telangiectasias, pitted keratoderma of the palms and soles, and a fine wrinkling, asteatosis, and atrophy of the skin. When

he was 3½ years old, heat intolerance was noted, and subsequent sweat testing revealed sweating only on the palms, soles, and forehead. Tan macules also began to appear on the upper trunk and forehead. During the next few years, the macules gradually progressed to a generalized poikiloderma which spared only the bathing trunk area. When the child was 3 years old, anal fissuring with stenosis occurred, and at the age of 6 years, he developed urethral meatal stenosis. Both stenoses were treated by dilatation under local anesthesia, and neither recurred.

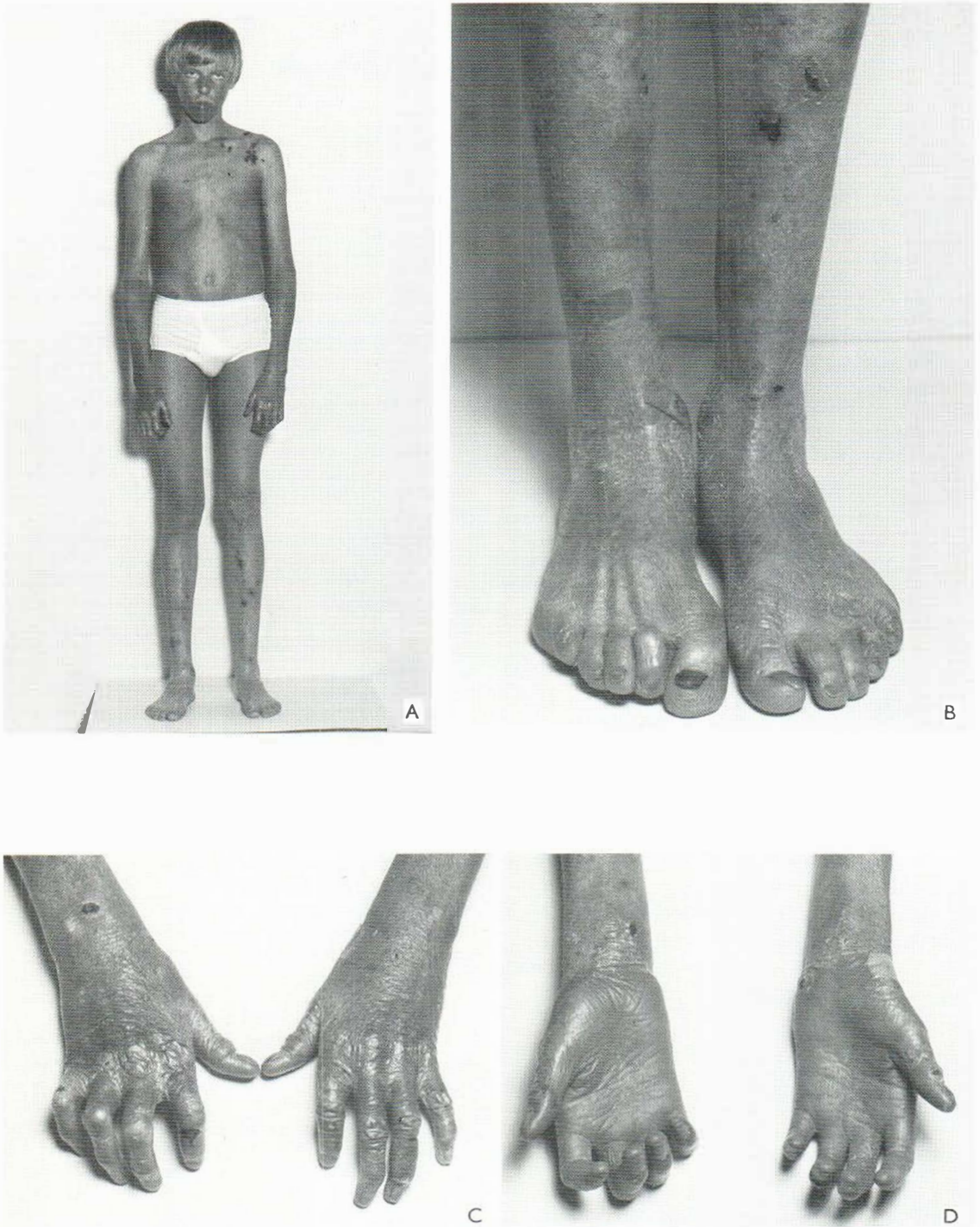
The problem of acral bulla formation improved somewhat with time, despite the increasing aggressiveness of the patient's activities. The keratoderma eventually resulted in flexion contractures and muscle atrophy in the hands. An interest in playing the trumpet resulted in an erosive cheilitis. The patient's defective dentition resulted in the extraction of several teeth and the capping of many of the others.

Therapy had been mainly symptomatic, with vigorous lubrication, sunscreens, vigorous and early treatment of cutaneous infection, and avoidance of overheating, trauma, and sunlight. A trial of oral vitamin E had been of no help.

The patient's general health was good. At the age of 6 years, he had undergone tonsillectomy; at the age of 12 years, he fractured a toe while playing football; and he fractured his right thumb when he was 14 years old. He had vague discomfort in his knees which had been diagnosed as osteochondrosis patellae. The patient's developmental milestones had been normal, and he was progressing normally at school. There was no history of nail or hair dystrophy, cataracts, leukokeratosis, carcinoma, or any of the stigmata of amyloidosis.

Various routine laboratory examinations and X-rays performed over the years had revealed no abnormalities. A skin biopsy from the left axillary fold showed poikiloderma with marked atrophy of the eccrine and sebaceous glands. A ground section of an extracted tooth revealed enamel hypoplasia, with an altered dento-enamel junction and pigmentation of the dentine. In July 1976 at the age of 14 years 9 months, the patient was referred to our clinic for further evaluation.

Physical examination revealed a well developed, well-nourished, hyperactive prepubertal boy in no distress (Fig. 1A). Except for yellowing, thickening, and medial deviation of the great toenails (Fig. 1B), the hair and nails were relatively normal. Many teeth were capped. Flexion contractures of the fingers with pitted keratoderma of the



*Fig. 1.* (A) General appearance. True poikiloderma was predominantly truncal, whereas acral areas were largely atrophic. Malar region was brightly telangiectatic. Numerous abrasions were the result of motorcycle accident. (B) Great toenails were hypertrophied and deviated

as a result of trauma; otherwise, nails were normal. Asteatosis reflects sebaceous gland atrophy. (C) Cutaneous atrophy and flexion contractures were evident. (D) Pitted keratoderma was probably the cause of flexion contractures.

palms and soles were present (Fig. 1C and D). There was generalized poikiloderma with accentuation in sun-exposed areas, prominent telangiectasia on the face, and hypopigmentation and hyperpigmentation on the trunk (Fig. 1A). An intact bulla was present on the left dorsal thumb. Nikolsky's sign was negative. There was mild acral desquamation and cutaneous atrophy, and there were obvious abrasions and ecchymoses of the arms and trunk from a recent motorcycle accident. Some interdigital maceration was noted on the toes. The remainder of the physical examination was normal.

Laboratory evaluation revealed a hemoglobin level of 11.6 g/dl, with normal indices, but a peripheral smear showed mild anisopoikilocytosis with scattered stomatocytes; but this was considered to be nonspecific and nondiagnostic. The leukocyte and differential counts were normal. A roentgenogram of the knees revealed an effusion in the right knee, but the bones were normal; a roentgenogram of the left hand and wrist revealed a bone age of 13 to 13½ years; a barium swallow and upper gastrointestinal series revealed no abnormalities. Sweat testing revealed complete anhidrosis. A minimal erythema dose of ultraviolet light from a hot quartz source showed no reaction at 10 seconds, and a delayed erythema dose of 80 seconds produced erythema in a reticulated pattern. The hot quartz source failed to elicit any erythema after 15 minutes when a window glass filter was used.

Biopsy of the traumatic bulla on the left thumb showed vacuolated degeneration of the basal layer, telangiectasia, mild inflammation, and a healing bulla. There were few sweat glands and sebaceous glands, and these were atrophic. Electron microscopy performed on the same tissue revealed anchoring fibrils attached to the basal lamina, but because of the age of the bulla, electron microscopy otherwise was not helpful in further elucidating the nature of the bulla formation. Delayed hypersensitivity skin testing showed significant reactions to *Candida*, purified protein derivative, and mumps.

Results of the following were either negative or within normal limits: chest roentgenogram, urinalysis, erythrocyte sedimentation rate (Westergren method), antinuclear antibody, serum protein electrophoresis, immunoglobulins, total hemolytic complement, and red cell and urinary porphyrins.

Orthopedic consultation revealed no evidence of osteochondrosis, loose bones, or cartilage fragments; and the patient's minor knee pains were ascribed to a tendinitis of the patellar tendon.

Investigation of possible hypogonadism was deferred because of the patient's age. However, if signs of puberty are not evident within 1 year, the possibility of hypogonadism will be investigated.

## DISCUSSION

In 1908, Mendes da Costa and van der Valk (1) described a syndrome of generalized nontraumatic bullae that was seen in infancy and developed into a reticulated hyperpigmentation that usually spared the trunk. The disorder has also been associated

with scarring alopecia, shortened and conical digits, skeletal anomalies, acrocyanosis, defective nails, dwarfism, microcephaly, and mental retardation. All reported cases have been from the same Dutch kinship, and the disorder seems to be unique among the congenital poikilodermas in its sex-linked recessive inheritance (2).

The dominant-inherited Franceschetti-Jadassohn syndrome consists of reticulated hyperpigmentation, palmoplantar keratoderma, hypohidrosis or anhidrosis, and defective dentition (3). Since the disorder was initially considered to be a noninflammatory variant of *incontinentia pigmenti*, cases in which the condition was transitional between the Franceschetti-Jadassohn syndrome and *incontinentia pigmenti* have been described (2).

In 1958, Hauss (4) described an autosomal-dominant reticulated hyperpigmentation which he found in two sisters and which he termed 'dermatopathia pigmentosa reticularis.' The pigmentation showed truncal accentuation and was associated with alopecia, nail dystrophy, and corneal abnormalities. Flegel (5) reported a similar case associated with ichthyosis. In 1970, van der Lugt (6) described a young woman who had a generalized, largely flexural, reticulated hyperpigmentation with some areas of depigmentation, palmoplantar hyperkeratoses with scattered keratotic lesions elsewhere, atrophic erythematous macules over various joints, and hypertrophic scarring. On one finger, there was an ainhum-like fibrotic band. The patient also had severe periodontal disease. She had had traumatic acral bulla formation (sometimes with hemorrhage) during childhood, and this had resulted in flexion contractures of the hands. Results of sweat testing were normal, and ophthalmologic examination revealed corneal punctae. An uncle and a cousin were reported to have had similar problems. Van der Lugt termed the condition 'dermatopathia pigmentosa reticularis hypohidrotica et atrophica.' Gahlen (7) described a similar, isolated case—that of a woman who had reticulated hyperpigmentation, lichenoid keratoses, alopecia, nail hypoplasia, axillary papillomatosis, and various ocular abnormalities, including pigmentation of Bowman's membrane.

Hamminga (8) described a child with generalized bullae in infancy in whom alopecia and facial poikiloderma developed later. The patient also had anhidrosis and conical fingers but no dental or ocular abnormalities.

Degos and Ebrard (9) described a young girl with congenital poikiloderma, acral bullae, hyperkeratoses, dystrophic teeth, clubbing of the digits, and hydrocephalus. As in the cases reported by Gahlen and Hamminga, there was no family history of similar problems.

In 1935, Liebermann (10) described a patient with generalized poikiloderma, numerous keratoses, and axillary, popliteal, and perianal papillomatosis. In 1957, Wodniansky (11) reported a child with congenital and largely flexural poikiloderma and perianal papillomatosis. The patient's mother had a similar but milder poikiloderma, and a sibling had syndactyly and nail dystrophy.

In 1969, Weary and his associates (12) described two unrelated black families with an autosomal-dominant poikiloderma that developed in early childhood and that was associated with a gradually progressive palmoplantar sclerosis and with linear or reticulated keratotic and sclerotic bands in the flexural areas of the extremities. Clubbing of the fingers also was present.

Cases of the Rothmund-Thomson syndrome have been reported in which bullae occurred on sun exposure during early childhood (13, 14), or in whom numerous acral keratoses occurred (15). At least three patients have also been reported in whom a congenital reticulated hyperpigmentation developed at birth or in early infancy and was associated with traumatic bulla formation (16, 17, 18).

Degos and Touraine (19) described an isolated case of childhood poikiloderma in a sun-sensitive distribution associated with acral bulla formation and acral lichenoid keratoses in whom a diiodo-hydroquin-responsive enteropathy was found. Weary et al. (20) described 10 similar patients in one family, but no enteropathy was present. They termed the disorder 'acrokeratotic poikiloderma.' The disorder showed an autosomal, dominant inheritance. Four additional patients have been described recently by Piñol Aguadé and his colleagues (21), and another by Drazin et al. (22).

Although a family history was unobtainable in our case, we believe that our patient's disorder should be grouped with the autosomal-dominant Franceschetti-Jadassohn (3) syndrome or 'dermatopathia pigmentosa reticularis hyperkeratolica et mutilans' of van der Lugt (6), which also is probably autosomal dominant. Unlike patients with the Franceschetti-Jadassohn syndrome, our patient had traumatic bullae; and unlike van der Lugt's patient,

our patient had anhidrosis. Our patient was also similar to those reported by Degos & Ebrard (9), except that ours had anhidrosis but no clubbing or hydrocephalus; and our patient was much like the patient described by Hamminga (8), except that our patient demonstrated a generalized rather than a localized poikiloderma and had defective dentition but not alopecia. Nevertheless, we believe that all these patients have more similarities than dissimilarities. Perhaps the autosomal-dominant congenital poikilodermas represent a single, diverse group, with the acrokeratotic, vesiculobullous poikilodermas as described by Weary et al. (20) and by Piñol Aguadé et al. (21) representing the more benign form of the disorder, since ectodermal defects were not noted by these authors. More cases need to be documented before the congenital poikilodermas can be adequately classified.

Emphasis on vesiculobullous or lichenoid and keratotic lesions in the congenital poikilodermas has probably detracted from many of the obvious similarities among these patients. Most true poikilodermas show basal cell vacuolization on biopsy, as do other dermatoses such as lichen planus, lupus erythematosus, and epidermolysis bullosa simplex (23). Because these dermatoses have all been associated with bullae, the congenital poikilodermas could also form bullae for the same reason. Also, disorders characterized by bulla formation are occasionally associated with hyperkeratotic lesions. Incontinentia pigmenti and the albopapuloid variety of epidermolysis bullosa dystrophica are the best examples of this. Thus, the bullous and lichenoid lesions in the congenital poikilodermas may be manifestations of the same defect, probably in the basal cell layer, which is responsible for the poikiloderma itself. The ectodermal defects in these disorders may have a similar genesis.

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