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We hope that making available the relevant information on Pachyonychia Congenita will be a means of furthering research to find effective therapies and a cure for PC.
Pachyonychia Congenita: A Mixed Type II–Type IV Presentation

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A 52-year-old woman in good health with a family history negative for dermatologic diseases presented to our department with thickening and dystrophy of all her fingernails and toenails that started when she was born. She also had hyperkeratosis on the palms of her hands and soles of her feet that was confined to sites of pressure and recurrent plantar blisters that began appearing at puberty. The patient reported marked pain while walking from such plantar involvement. Her medical history revealed a persistent hoarseness; palmoplantar hyperhidrosis; and the appearance of numerous cysts on her back, neck, and scalp since she was 20 years old. These latter lesions had been diagnosed as multiple steatocystoma on the basis of the histologic features. Upon examination, all of her fingernails and toenails appeared shortened, thickened, and dystrophic (Figures 1–3). In addition, they presented subungual keratosis and a yellowish-gray color. Hyperkeratosis and small ulcerations were present on the perionychium. Palmoplantar keratoderma was evident, especially on the soles, in association with superficial erosions (Figure 4). Keratosis pilaris was evident on the extensor surfaces of the forearms as well as on the anterior surfaces of the legs. Multiple nodules were detected on the patient's neck, trunk, and axillary regions (Figure 5). They consisted of multiple steatocystoma and were characterized by a hemispheric shape, a normal-appearing skin color, and by an elastic consistency on palpation. Oral and dental changes were not detected, although hair anomalies were evident. Laboratory parameters disclosed eosinophilia and increased total IgE levels. The results of serum protein electrophoresis was normal, as were those concerning hepatic and renal functions. The ophthalmology examination showed neither corneal dyskeratosis nor cataracts. The neurologic–psychiatric visit revealed slight mental retardation.

Pachyonychia congenita (PC) is a rare hereditary disorder characterized by gross thickening of all nails of the fingers and toes.1 Dyskeratosis of skin and mucous membranes can be associated, as can palmar and plantar hyperhidrosis, natal or neonatal teeth, and hair anomalies. Among concomitant diseases, the most common is steatocystoma multiplex, but cataracts, laryngeal lesions, hoarseness, and mental retardation often coexist.

This condition is usually inherited as an autosomal dominant trait, but recessive forms have also been described.2 Mutations in the genes encoding keratins K6a, K6b, K16, and K17 cause fragility of specific epithelia for the formation of abnormal tonofilaments, resulting in different phenotypes of PC.3–5

According to the classification devised by Feinstein et al.,1 there are four types of PC, although two are most commonly reported (Table). In PC type I (Jadassohn-Lewandowsky syndrome), palmoplantar hyperkeratosis, follicular keratosis, and oral leukokeratosis are found in addition to nail hypertrophy. PC type II (Jackson-Lawler syndrome) has natal or neonatal teeth, steatocystoma multiplex, and bullae of palms and soles in association with clinical findings of type I; however, in type II, oral lesions or significant keratoderma are rare. PC type III consists of the findings of the previous categories plus leukokeratosis of the cornea, cataracts, and angular cheilositis. Type IV, which is rarely described, consists of the signs and symptoms of subtypes I, II, and III in association with laryngeal lesions, hoarseness, mental retardation, hair anomalies, and alopecia. However, Vogt6–7 described a variant of PC type I characterized by additional features, such as dyschromic alterations of nails in association with distal and transversal striations, diffuse hypotrichia, microphthalmos, microcornea, cataracta stellata, cataracta polaris posterior, hypoplastic testicles with oligospermia, and harmonic short stature.

In addition to the Feinstein classification, numerous subdivisions of PC have been previously suggested,8,9 Useful diagnostic criteria have been recently established for types I and II on the basis of both phenotype and genotype data: mutations in the genes encoding keratins K6a and K16 produce the PC type I phenotype, whereas K17 mutations cause type II; the presence of pilosebaceous cysts following puberty is the best indicator of PC type II; prepubescent patients are more difficult to classify due to the lack of cysts; and natal teeth are indicative of PC type II, although their absence does not preclude the PC type II phenotype.10
According to these new criteria, our case could surely be classified as Feinstein type II. However, because of the unusual presentation of this case, we believe it can be considered a mixed type of PC, fitting prevalently into the Jackson-Lawler syndrome but with hoarseness, mental retardation, and hair anomalies suggestive of type IV PC.

Other sporadic reports of the literature recognize new types of PC. For example, symptoms consisting of thickening of all nails in association with severe generalized hypotrichosis in the absence of keratins mutations have been discovered in two patients.\textsuperscript{11}

PC should be differentiated from traumatic thickening of nails and from congenital onychogryphosis, which is easy to distinguish because it does not involve all nails and is not associated with dyskeratotic skin lesions.

Concerning treatment, emollients and keratolytics as well as retinoids are usually prescribed for palmoplantar hyperkeratosis.\textsuperscript{12} Oral retinoic acid has been also demonstrated to improve the hyperkeratotic skin lesions.\textsuperscript{11} This drug was not tolerated by our patient, who developed increased serum glutamic-oxaloacetic transaminase values after few months of treatment.

We adopted a regimen of 2% glutaraldehyde solution that effected a marked improvement of the hyperkeratotic plantar lesions. Topical glutaraldehyde has been used over the years for plantar hyperhidrosis because of its antiperspirant effect as well as for hyperkeratotic diseases.\textsuperscript{14,15}

\textbf{REFERENCES}


Table. Classification of Pachyonychia Congenita Proposed by Feinstein et al.¹

<table>
<thead>
<tr>
<th>Type</th>
<th>Basic Clinical Findings</th>
<th>Additional Clinical Findings</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Nail hypertrophy, palmoplantar keratosis, follicular keratosis, oral leukokeratosis</td>
<td>...</td>
<td>56.2</td>
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<td>II</td>
<td>Clinical findings of type I</td>
<td>Bullae of palms and soles, hyperhidrosis of palms and soles, natal or neonatal teeth, steatocystoma multiplex</td>
<td>24.9</td>
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<tr>
<td>III</td>
<td>Clinical findings of type II</td>
<td>Angular cheilosis, cornal dyskeratosis, cataracts</td>
<td>11.7</td>
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<tr>
<td>IV</td>
<td>Clinical findings of type III</td>
<td>Laryngeal lesions, hoarseness, mental retardation, hair anomalies, alopecia</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Figure 5. Steatocystoma multiplex: multiple epidermal cysts on the neck.