

TRICHO-RHINO-PHALANGEAL SYNDROME IN FIVE SUCCESSIVE GENERATIONS: REPORT ON A FAMILY IN FINLAND

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Abstract. A family of 11 members with tricho-rhino-phalangeal syndrome (TRP syndrome) is described. The inheritance in five successive generations was autosomal dominant. The main features of the TRP syndrome noted were: sparse hair, pear-shaped nose and joint deformity with cone-shaped epiphyses at some of the middle phalanges of the hands.

Key words: Genetic disorder; Dominant inheritance; Hypotrichosis; Cone-shaped epiphyses

In 1966 Giedion described a rather rare dysplasia named the tricho-rhino-phalangeal syndrome (TRP syndrome) (2). The symptoms of this syndrome closely concern the fields of genetics and paediatrics as well as radiology for the joint deformity and also dermatology because of hair loss and nail changes.

The main diagnostic features of the TRP syndrome are sparse, slowly growing hair; broad, pear-shaped nose, and peripheral dysostosis with type 12 cone-shaped epiphyses at some of the middle phalanges of the hands (5).

Additional variable symptoms described are shortness, Perthes-like changes of the hips, enlarged philtrum and medially thick, laterally thin eyebrows—"the Herthoge sign" (6).

Giedion et al. have demonstrated autosomal dominant inheritance in most of the 60 families described in the literature (5). These pedigrees comprise two or three generations.

We describe here a family in Finland with 9 clinically confirmed cases and two probable cases of the TRP syndrome. The pedigree of the family shows autosomal dominant transmission of the disease in five consecutive generations.

DESCRIPTION OF THE FAMILY AND TWO CASE REPORTS

Family. The records of this family in the parish register could be traced back to the early 18th century (Fig. 1). Forty-two members were clinically examined and old photographs and traditional information were collected on 16 other members of the family. They all—58—have a little crossline marked in the ancestry entry.

Nine subjects, 5 male and 4 female, of the clinically examined persons showed the typical appearance of the TRP syndrome. Each had 6-10 typical symptoms of this syndrome, as summarized in Table I. The table also notes two deceased cases, one male and one female, with 4-5 symptoms of TRP syndrome clearly identifiable in old photographs.

The most prominent symptom was the pear-shaped nose which, together with "the Herthoge sign", enlarged philtrum and a small pretubercle below the lower lip, were present in all 11 cases.

Eight subjects had sparse hair or partial baldness. Three women had quite normal hair, however.

Body height was below normal in 7 cases. It was below 2.5% in 5. Deformation of the finger joints was seen in 8 cases, in 3 of whom the X-rays showed type 12 cone-shaped epiphyses in one or more mid-phalanges.

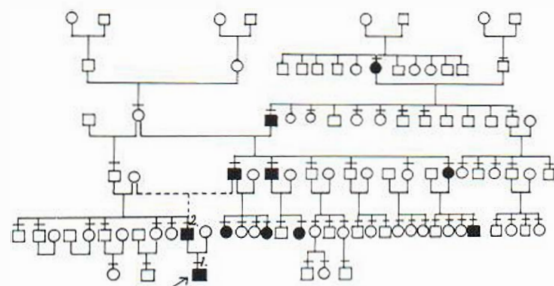


Fig. 1. The pedigree of the family of 11 members with tricho-rhino-phalangeal syndrome in five consecutive generations.

Table I. The symptoms of the tricho-rhino-phalangeal syndrome observed in 9 clinically confirmed cases and 2 deceased cases

K=koilonychia, L=leukonychia, R=racket nails

	Age	Sex	Sparse hair	Pear-shaped nose	Deformity of finger joints	Enlarged philtrum	Hertthoge sign	Protuberance below lower lip	Perthes-like changes of hips
Clinically examined cases									
K. R. (case 1)	2	♂	+	+	—	+	+	+	—
H. R. (case 2)	25	♂	+	+	+	+	+	+	—
					(X-ray, type 12, I-III, V)				
T. N.	12	♂	+	+	+	+	+	+	+(X-ray)
H. K.	13	♀	+	+	+	+	+	+	—
I. K.	19	♀	—	+	+	+	+	+	+(X-ray)
H. K.	23	♀	—	+	+	+	+	+	—
M. N.	38	♀	+	+	+	+	+	+	+(X-ray)
E. K.	43	♂	+	+	+	+	+	+	—
					(X-ray, type 12, II)				
N. K.	50	♂	+	+	+	+	+	+	—
					(X-ray, type 12, II-IV)				
Probable TRP-cases (deceased)									
V.K. 1901		♂	+	+		+	+	+	
A. S. 1872		♀	—	+		+	+	+	

Perthes-like changes in X-rays were noted in 3 cases. Six had poor alignment of the teeth. The nails were flattened, koilonychia-like in 7 cases. One of them had a partly total and partly partial leukonychia with racket nails on the thumbs. Racket nails were also noted in 2 other cases.

Case 1. Proband K. R., a 2-year-old boy, was first brought to the Department of Dermatology in the Tampere Central Hospital in Finland when he was 5 months old because of abnormally slow-growing sparse hair.

He was the mother's—18—first child. The pregnancy was considered normal. Birth weight was 3860 g and length 49 cm. At birth he scored 8–8 Apgar points.

The baby's syndrome-like appearance was already noted on the maternity ward. Development in infancy was normal. Both weight and length were constantly between the 14th and 16th percentile.

The boy's skull is of normal size; it looks oval and compressed at the sides. The ears are large and somewhat prominent. The philtrum, i.e. the distance between the prominent pear-shaped nose and the prolabium appears enlarged (Fig. 2).

The hair is sparse, downy, light and about 1–2 cm long. The eyelashes are thin, projecting in all directions. The eyebrows are undeveloped—the lateral parts are still absent. The lanugo hair is about normal. The nails are flattened, koilonychia like, and of normal colour.

At 2 years 3 months calendar age his bone age is (according to Greulich and Pyle) only 1 year 3 months. Cone-shaped epiphyses are not yet to be observed in

X-ray pictures. The extremities and body build seem normal. No pathological findings in lungs, heart or other organs. There is a small umbilical hernia on the abdomen.

Case 2. H. R. 25, father of the proband. His own (biological) father (see the pedigree) also has the TRP syndrome. Six healthy siblings have a different father.



Fig. 2. Sparse hair, pear-shaped nose and enlarged philtrum give the syndrome-like appearance of the tricho-rhino-phalangeal syndrome (cases 1, 2).

Poor alignment of teeth	Body height	Nail changes
-	<16%	K
+	<2.5%	K, R
-	<2.5%	-
+	<16%	K
-	50%	-
+	>16%	K
+	<2.5%	K
+	<2.5%	K, R
+	<2.5%	K, R, L

The shape of the head and face is oval, the nose broad and pear-shaped (Fig. 2), and the philtrum enlarged. Below the lower lip there is a prominent protuberance in the regio alveolaris maxillae. Ever since childhood his hair has been sparse, light and very slow to grow; it has sometimes been cut on the temples. The crown is almost bald.

The eyebrows are medially thick and laterally thin. The eye-lashes, beard and other hair are sparse. The alignment of the teeth is poor.

The fingers are short and the joints thickened (Fig. 3). A roentgenogram of the hands shows peripheral dysostosis with type 12 cone-shaped epiphyses in I, II, III and V mid-phalanges. The nails are flattened, koilonychia-like, normal in colour. The distal phalanges of both thumbs are short and the nails correspondingly short and wide—the so-called racket nails.

DISCUSSION

Besides typical cases having all the characteristic features of the TRP syndrome the literature describes *formes frustes* or "mixed cases" showing only some of the symptoms. For example, Cruz & Frances describe a girl with the full syndrome, while the mother, who was similarly afflicted, had a normal nose (1). Pashayan reports a family with three typically afflicted children (8). The father had other signs of the TRP syndrome, but not the joint changes.

In the family reported here, three women had normal hair even though the other main symptoms were present. These subjects all had the pear-shaped nose and "the Herthoge sign", i.e. medially thick and laterally thin eyebrows. The philtrum was enlarged and in every case there was a small protuberance below the lower lip. These dimensions must be estimated by eye, in the absence of any fixed standards.

Giedion has classified and differentiated cone-shaped epiphyses into 38 varieties. Of these, 25 types are associated with heredo-degenerative disorders. Besides type 12, types 25 and 32 are also found in connection with the TRP syndrome (3, 4).

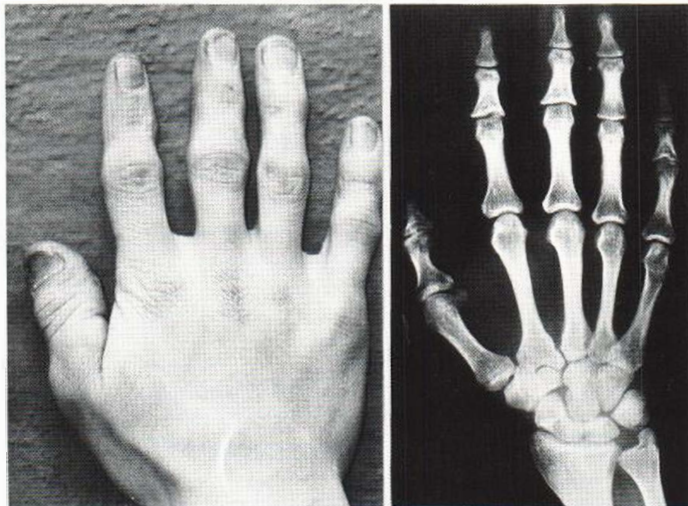


Fig. 3. Deformity of finger joints, with cone-shaped epiphyses in I-III and V mid-phalanges. Koilonychia and racket thumb nail. Similar changes in both hands (case 2).

We found type 12 in 3 patients. Perthes-like changes as described by Silverman in connection with the TRP syndrome were found in 3 cases (10). The body height in 5 of our cases was below 2.5%, which corresponds to the results of Giedion et al. (5).

Klingmüller described koilonychia and racket thumb nails in the TRP syndrome (6, 7). Koilonychia was present in 7 patients clinically examined. Three of these had shortened distal phalanges in the thumbs and correspondingly short, wide and flattened racket nails. According to Samman this deformity usually occurs independently and is dominantly inherited (9). One of our patients with koilonychia and racket nails also had partly total/partial leukonychia. This may be the same disorder which Giedion et al. found in one of their patients. They called it mother-of-the-pearl discoloration (5).

The intelligence of the patients described here seemed to be about normal. They are representatives of the normal rural population of Finland. The deformity of the fingers has never prevented them from working. Only those with Perthes changes in the hips had previously consulted a doctor. The youngest members of the family were troubled by their exceptional appearance, particularly by the sparse hair.

Since the TRP syndrome does not seem to involve any symptoms more harmful to the health, the question might arise whether this disorder is more common than previously thought.

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