Case 12
Multiple linear skin lesions since birth

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Patient: A 7-year-old Thai female from Nakornsawan

Chief complaint: Multiple linear skin lesions since birth

Present illness:

She had multiple linear dark yellowish skin lesions on the scalp, chin, neck, chest, right arm, leg and sole since birth. The lesions gradually increased in size and number, with sometimes caused irritating symptoms. At 1 year old, she had difficulty to walk due to right leg deformities. Her parents deny history of seizure, paresthesia and abnormal vision.

Past history:

- She was born at term and non-consanguineous parents
- Normal developmental milestones

Family history: Nil

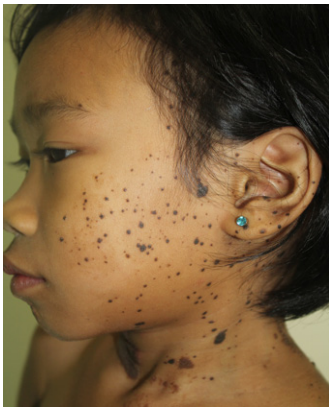
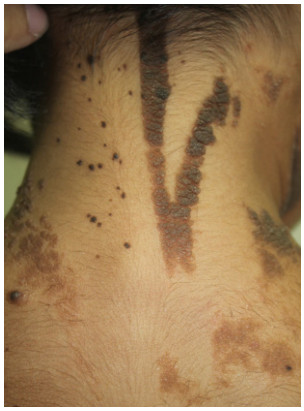
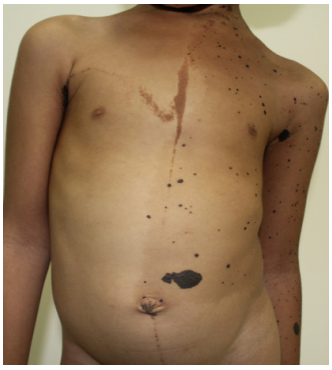
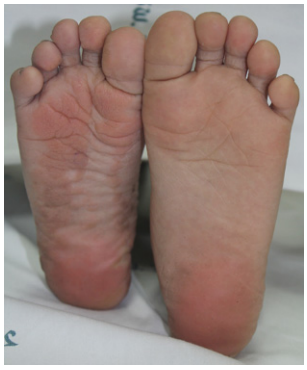
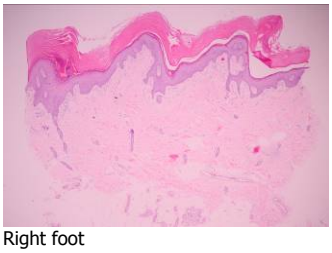
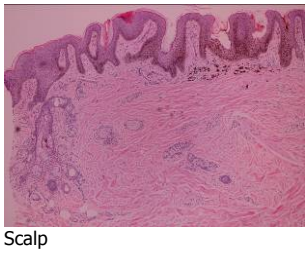
Skin examination:

- Multiple linear dark yellowish and brownish plaques with some verrucous surface along Blaschko's lines on the scalp, upper back, right side of neck, medial aspect of right arm, trunk, back, right leg and foot
- Multiple dark brownish and black macules and papules scattered on the background of large, light brownish patches

Physical examination:

HEENT: Not pale conjunctivae, no icteric sclera, no oral ulcer
Heart: Normal S1 S2, no murmur
Lung: Normal breath sound
Abdomen: Soft, no hepatosplenomegaly
Neurological system: Intact
Musculoskeletal system:

- Varus deformity of right leg
- Limb length discrepancies (right leg shorter than left leg)
- Mild scoliosis

Right foot Scalp

Histopathology: (S13-27827)

Scalp: There is papillated epidermal hyperplasia and proliferation of pigmented melanocytes in nest at the dermo-epidermal junction in association with malformed pilosebaceous structure.

Right foot: There is compact hyperkeratosis papillomatosis and mild epidermal hyperplasia.

Investigation:

Laboratory tests

Calcium 2.3 mmol/L (2.2–2.7), Phosphorus 0.6 mmol/L (1.2–1.8)
PTH 12.4 pmol/L (3.7–15.9)
25-OHD 61.2 nmol/L (>50), ALP 2,877 U/L (169–372)

Imaging study

Skeletal X-ray:

- Poor mineralization with rachitic changes, including flaring, cupping and fraying of metaphyses of both wrists and ankles
- Scattered areas of poorly defined lucency fibrous dysplasia-like lesions at right femur, tibia and fibula

Diagnosis: **Phacomatosis pigmentokeratotica with hypophosphatemic rickets**

Treatment:

- Supplement with phosphate solution and active vitamin D
- 0.125% tretinoin in vanishing cream apply right leg plaque at bedtime
- Medications:
  - Calcium carbonate 1,200 mg/day
  - Multivitamin 1 tab once daily
  - Vitamin D2 20,000U every 3 weekw
  - Alfacalcidol 2 gm/day
  - Phosphate solution 2 tsp PO 5 times daily

Discussion:

Phacomatosis pigmentokeratotica (PPK) is classified in a distinct disorder in the group of epidermal nevus syndromes[1], first described in 1996[2], characterized by a co-occurrence of
organoid nevus with sebaceous differentiation arranged along Blaschko's lines, and speckled lentiginous nevus of the papular type (papular nevus spilus) arranged in a checkerboard pattern[3].

This distinctive syndrome has been hypothesized to be due to so-called didymosis, also known as the twin spot phenomenon. Half of PPK would be Schimmelpenning syndrome, and the other half would be speckled lentiginous nevus (SLN) syndrome. It has been hypothesized that co-occurrence of the two different nevi represents this twin spotting which are paired patches of mutant tissue that are dissimilar from each other and from the background tissue. To impute "twin spotting," it is necessary for the two different recessive mutations to be located on the same chromosome. The chromosomes bearing these loci would then be exchanged through somatic crossing over in the early stages of embryogenesis, giving rise to two different homologous daughter cells that evolve into two different mosaic lesions[4].

Schimmelpenning syndrome is defined as the association of the linear nevus sebaceous arranged along the Blaschko lines and extracutaneous involvement[1]. The common extracutaneous features include skeletal defects, neurologic defects such as hemimegalencephaly with contralateral motor disease, and ocular abnormalities, including coloboma and epibulbar lipodermoid. Skeletal defects in this syndrome include bone cysts, kyphosis and scoliosis, foot and hand deformities, and hypophosphatemic rickets.

SLN syndrome is defined as nevus spilus, consists of a cafe aulait macule with multiple dark brown or black dots that represent macular or papular proliferations of melanocytes superimposed. Neurologic abnormalities associated with SLN syndrome are hyperhidrosis, muscular weakness, dysesthesia, sensory and motor neuropathy[5].

PPK is a distinct type of epidermal nevus syndrome that occurs sporadically.[1] PPK is limited to the skin or associated with extracutaneous abnormalities. The pattern of extracutaneous anomalies reported in PPK represents the variable features of Schimmelpenning syndrome or SLN syndrome. The major neurologic abnormalities in PPK are mental deficiency, seizures, hemiparesis, hyperhidrosis, cutaneous dysesthesia, muscular weakness, sensory neuropathy, and motor neuropathy. Additional

extracutaneous presentations have been reported in the literature, such as ptosis, strabismus, congenital glaucoma, esotropia, conductive hearing loss, facial dysmorphism, hemiatrophy, kyphosis, scoliosis, and hypophosphatemic rickets. Hypophosphatemic rickets is caused by a defect in phosphate reabsorption at the proximal renal tubule, which the mechanism are renal phosphate wasting owing to fibroblast growth factor 23, which is produced and released from the epidermal nevi.[6-7]

Skin and internal malignancies are considered a risk in PPK. These often occur on the skin and included basal cell carcinoma and malignant melanoma. In addition, extracutaneous neoplasms have also been described, such as subcutaneous rhabdomyosarcoma[8] and pheochromocytoma.

In summary, this is a case of PPK, the rare distinct epidermal nevus syndrome with hypophophatemic rickets as extracutaneous features. The patient was received supplementation with phosphate, vitamin D and topical treatment with emollient and tretinoin cream.

References:

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