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Photo vignette

Red-white and blue baby: a case of phacomatosis pigmentovascularis type V

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Abstract

Phacomatosis pigmentovascularis is a rare genodermatosis characterized by the combination of an extensive pigmentary nevus with a widespread vascular nevus. The coexistence of aberrant dermal melanocytosis and cutis marmorata telangiectatica congenita has been termed phacomatosis pigmentovascularis type V or phacomatosis cesiomarmorata. Phacomatosis pigmentovascularis type V was first described in a 3-month-old boy in 2000. Since then, there have been a further seven cases published in the literature.

Introduction

Phacomatosis pigmentovascularis (PPV) describes the clinical combination of an dermal melanocytic nevus and a vascular malformation [1]. In 1985, PPV was classified into four types according to the epidermal component and the associated vascular malformation: Type I, nevus flammeus (port-wine stain) with nevus pigmentosus et verrucosus; Type II, nevus flammeus with aberrant dermal melanocytosis; Type III, nevus flammeus with nevus spilus; Type IV, nevus flammeus with both aberrant dermal melanocytosiss and nevus spilus. Each type is further classified as subtype a (oculocutaneous disease only) or subtype b (extracutaneous disease)[1].

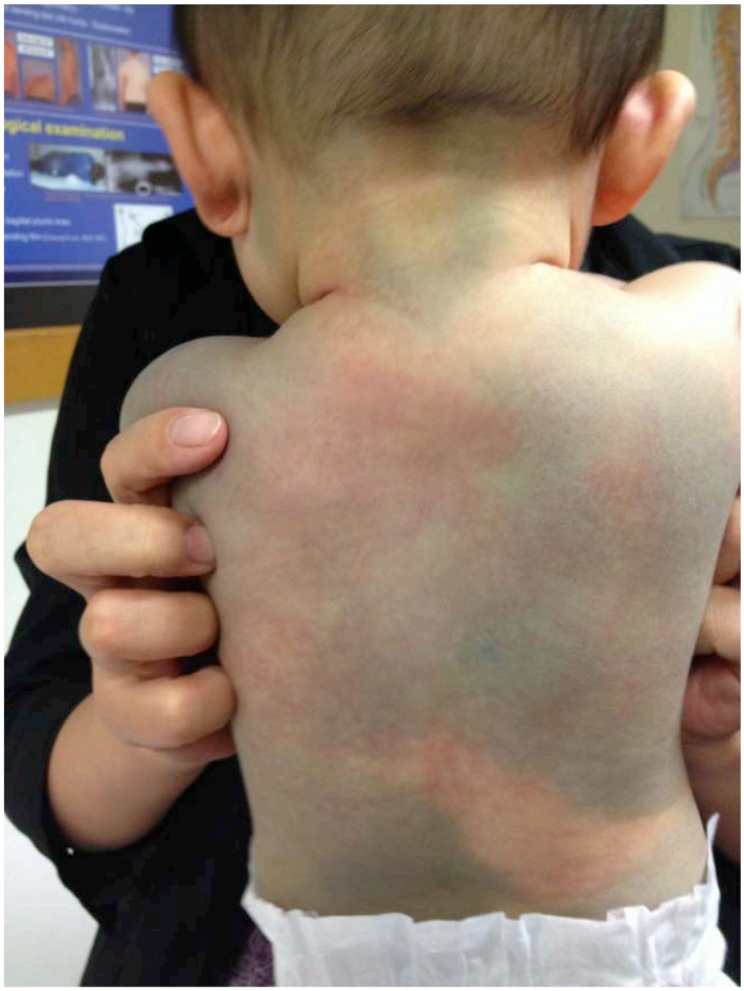
The co-occurrence of cutis marmorata telangiectatica congenita (CMTC) and dermal melanocytosis was first described by Enjolras and Mulliken [2]. In 2003, this association was reported in a further two cases at which time PPV type 5 was proposed to categorize this association as a distinct entity [3].

Case synopsis

A 6-month-old girl presented for evaluation of her congenital skin discoloration. She was born at 41 weeks via spontaneous vaginal delivery after an uneventful pregnancy. At birth, she was presumed to be peripherally cyanosed, because of her bluish appearance. As a result, she received resuscitation with CPAP until it was realized to be related to extensive dermal melanocytosis. Her parents were both of Chinese background and were not consanguineous. There was no family history of inherited diseases or birthmarks.

On examination, extensive greyish-blue patches (dermal melanocytosis) involving her left arm, back, buttock, legs, and smaller areas on right chest, right temple, and left preauricular area were noted (Figure 1). In addition, marble-like reddish-blue patches consistent with CMTC were observed on her chest, back, buttock, arms, and legs (Figure 2). In many areas CMTC and dermal melanocytosis co-existed. There was no oral involvement or ocular pigmentation evident. A pediatric ophthalmologist found no signs of glaucoma or retinal involvement. Her left leg, which was associated with CMTC, was marginally shorter and thinner than her right leg. Further physical examination and neurological review performed by a pediatric neurologist was normal.

The patient did not display signs of inborn errors of metabolism. However, owing to the association of extensive dermal melanocytosis and lysosomal storage diseases, investigations were done. Both urine and blood tests were normal: urine glucosaminoglycans, leukocytes lysosomal enzymes (alpha-galactosidase, aryl-sulphatase A, beta-galactosidase, N-Acetyl-beta-hexosaminidase, alpha-mannosidase, alpha-fucosidase, beta-mannosidase, beta-glucuronidase, alpha-N-acetylgalctosaminidase, cholesteryleterase, cholesterylesterase, beta glucosidase), plasma lysosomal enzymes (alpha-mannosidase, beta-glucuronidase, N-acetyl-beta-hexosaminidase, chitotriosidase).



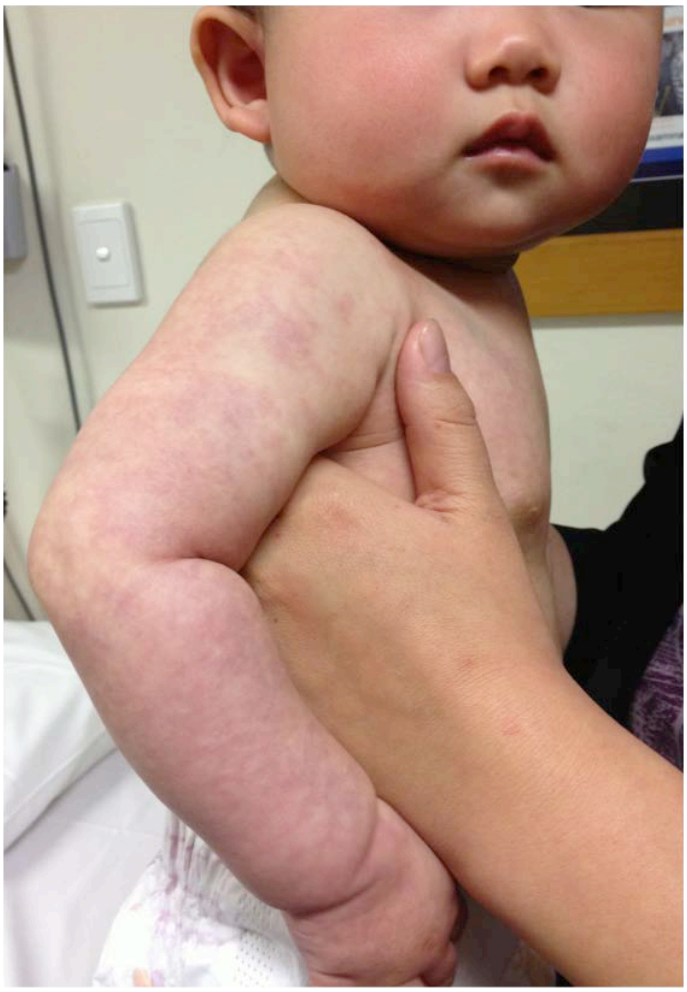


Figure 1. Extensive dermal melanocytosis with bilateral reticular vascular lesion. **Figure 2.** Reticular vascular lesion consistent with cutis marmorata telangiectatica congenita

At her latest follow up at 9 months of age, she showed normal developmental milestones. The aberrant dermal melanocytosis showed some fading but pigmentation was still visible, whereas the CMTC remained mostly unchanged. The lower limb discrepancy had resolved.

Discussion

PPV was first described by Ota et al in 1947 to define the association between cutaneous vascular malformations and pigmented nevi [4]. A new subtype of PPV was recently included to describe the association between dermal melanocytosis and CMTC [2]. Originally described in 2000 [5], there have been a further 6 cases of PPV type V reported (table 1)[3, 6-9].

Table 1. Reported associations with PPV type 5

Author	Gender	Associations
Enjolras et al 2000[2]	Male	Unknown
Torrelo et al 2003[3]	Female	Blue sclera Diminished corneae
Torrelo et al 2003[3]	Male	Unilateral lower limb hyperplasia Asymmetry of cerebral hemispheres and ventricles Nevus of Ota
Torrelo et al 2006[7]	Male	Unilateral lower limb atrophy
Larralde et al	Female	Leucocoria

2008[6]		Asymmetry in lateral ventricles
Fernandez-Guarino et al 2008[8]	Male	Melanosis oculi Phakomatosis cesiomarmorata Nevus of Ota
Smith et al 2012[9]	Male	Glaucoma

PPV type V is the only subtype to include an association with CMTC. Cutis marmorata telangiectatica congenital is a vascular abnormality characterized by a reticular vascular pattern in a mosaic distribution, which can be widespread or localized [10]. It can be associated with underlying tissue hypertrophy [7] or atrophy [3] as well as other vascular malformations. A variety of neurological, ophthalmological, musculoskeletal, cardiovascular, and cutaneous abnormalities have been associated with CMTC [10-13]. Other cutaneous associations reported include nevus flammeus [11, 13], hemangioma [10, 12, 13], and café-au-lait spots [10].

The exact etiology of PPV is unknown. The genetic phenomenon of non-allelic twin spotting has been suggested as a mechanism to explain the association of CMTC and dermal melanocytosis [3]. This is a concept whereby two different mutant alleles at the same locus or at nearby loci (via somatic recombination) generate two, genetically different, clones of neighboring mutant cells in a background of normal cells [14].

Dermal melanocytosis is observed at birth in 100% of Chinese infants; 14.1% and 6.5% of them involve the back and lower limb, respectively [15]. These typically fade by age 6 to 7 years with 2% persisting at age 10 years [15]. Extensive and persistent dermal melanocytosis is a prominent feature in some patients with lysosomal storage diseases, particularly mucopolysaccharidoses (Hunter syndrome and Hurler syndrome) and GM1 gangliosidosis [16]. In our case, metabolic screening for lysosomal storage disease was negative. The association between dermal melanocytosis and lysosomal storage diseases in the asian population may be a coincidence. However, additional studies are required to clarify the predictive value of the presence of dermal melanocytosis.

Conclusion

PPV type V is rare and the diagnosis is mainly clinical. Ocular abnormalities, particularly melanosis oculi, are common in PPV type V. It is recommended that all patients have an eye examination performed by a pediatric ophthalmologist. Patients with CMTC should be evaluated for associated anomalies, particularly body asymmetry, glaucoma, and neurological disorders. An association between extensive dermal melanocytosis and inborn errors of metabolism is currently unclear. A close observation is recommended.

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