SAGE Open Medical Case Reports

SAGE Open Medical Case Reports
JCMS Case Reports
Volume 7: 1–3

DOI: 10.1177/2050313X19876725
journals.sagepub.com/home/sco
SAGE

Linear and whorled nevoid hypermelanosis and Joubert syndrome: a novel association: A case report and literature review

Carolina Fernandes, Andréanne Waddell and Sara-Élizabeth Jean

Abstract

This report discusses a case of linear and whorled nevoid hypermelanosis associated with cerebellar atrophy, ocular and developmental anomalies compatible with Joubert syndrome. Linear and whorled nevoid hypermelanosis is a rare disorder of skin pigmentation characterized by swirls and whorls of hyperpigmented macules in a reticulate pattern along Blaschko's lines. Neurologic, cardiac, skeletal and developmental anomalies have been reported. We present a case of linear and whorled nevoid hypermelanosis on an 18-year-old woman who also presented with cerebellar atrophy, jerk nystagmus, macrocephaly and developmental delay. Those symptoms were compatible with Joubert syndrome. A complete work-up failed to reveal other systemic or skeletal anomalies. No chromosomal alteration was found on karyotyping carried out on a skin specimen. Much remains to be known about linear and whorled nevoid hypermelanosis. It is generally a benign condition but association with various congenital anomalies have been reported. Proper work-up is advised in order to exclude congenital anomalies.

Keywords

Genodermatosis, blaschkoid lesions

Introduction

Linear and whorled nevoid hypermelanosis (LWNH) is a rare disorder of skin pigmentation characterized by swirls and whorls of hyperpigmented macules in a reticulate pattern along Blaschko's lines.[1] Neurologic, cardiac, skeletal and developmental anomalies have been reported.[2]

Our primary objective is to present and discuss a case of LWNH associated with cerebellar atrophy as well as ocular and developmental anomalies compatible with Joubert syndrome. To our knowledge, association of LWNH with Joubert syndrome has rarely been described. Our secondary endpoint is to discuss reported systemic associations and devise a proper work-up in order to exclude congenital anomalies.

Case report

An 18-year-old woman presented with asymptomatic linear and reticular hyperpigmentation on upper and lower limbs following Blaschko's lines (Figures 1–3). Lesions appeared shortly after birth and did not change throughout the years. Mucosae, palms, soles and skin appendages were unaffected. Parents denied any history of vesicular lesions at birth or similar pigmented lesions on other members of the family. There was no history of verrucous or hypopigmented lesions. Five café-au-lait macules were also found on physical examination. Cutaneous and systemic investigation did not show any other classical sign of neurofibromatosis.

The patient also presented with cerebellar atrophy, jerk nystagmus, macrocephaly and developmental delay. Those symptoms were compatible with Joubert syndrome, an autosomal recessive disorder caused by mutations related to cell structures called primary cilia.[3,4] Comparative genomic hybridization carried out on blood sample had failed to show differences in DNA sequence and number.

A complete work-up failed to reveal other systemic or skeletal anomalies. Family history revealed consanguinity

Department of Dermatology, University of Sherbrooke, Sherbrooke, QC, Canada

Corresponding Author:
Carolina Fernandes, Department of Dermatology, University of Sherbrooke, 580, Rue Bowen S, Sherbrooke, QC J1G 2E8, Canada.
Email: carolina.lucena.fernandes@usherbrooke.ca

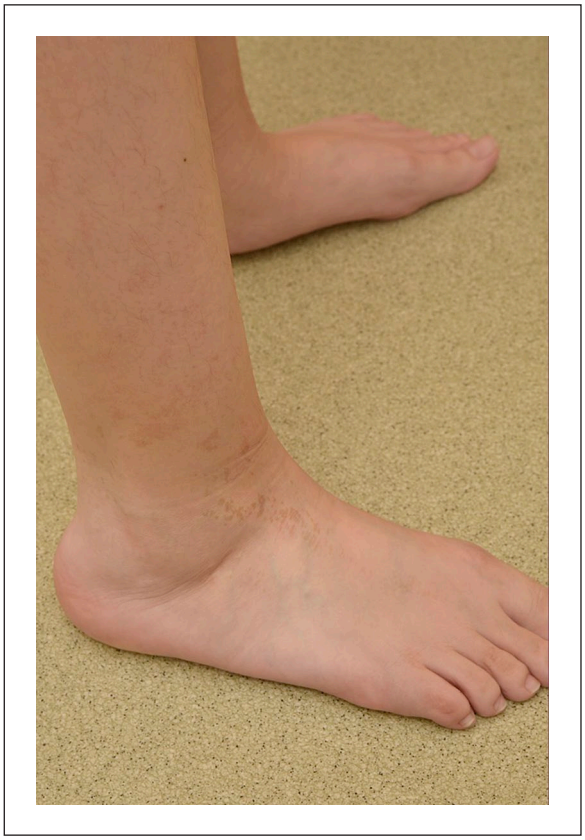

Figure 1. Linear and whorled hyperpigmented macules on patient's leg.

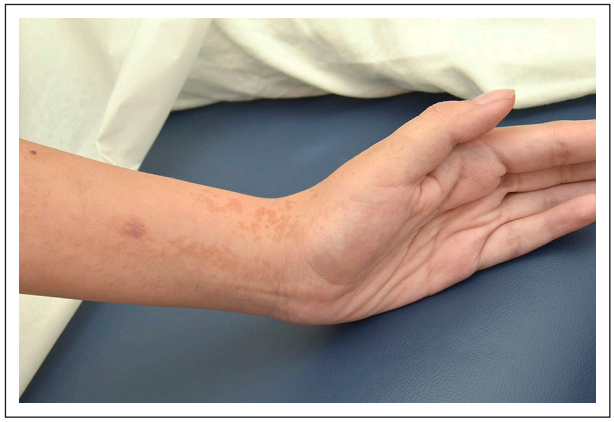

Figure 2. Linear and whorled hyperpigmented macules on patient's left arm.

between the parents. No chromosomal alteration was found on karyotyping carried out on a skin specimen.

Discussion

LWNH is a rare disorder of skin pigmentation characterized by swirls and whorls of hyperpigmented macules in a reticulate pattern along Blaschko's lines. Lesions usually appear within a few weeks from birth and rapidly stabilize within the first 2 years of life.[5] A late-onset form has also been described.[6,7]

Figure 3. Linear and whorled hyperpigmented macules on patient's right arm.

Table 1. Suggested investigation for LWNH.

	Suggested frequency
Neurodevelopmental and psychomotor development	Periodically
Head circumference	
Limb measurement	
Ophthalmic evaluation	Upon diagnosis or following symptomatology
Audiologic evaluation	
Cerebral and heart imaging	

LWNH: linear and whorled nevoid hypermelanosis.

LWNH must be differentiated from many pigmentary disorders. Incontinentia pigmenti presents with a vesicular and verrucous stage prior to the pigmentary appearance.[8] Hypomelanosis of Ito is a sporadic skin condition involving the central nervous system, eyes, and musculoskeletal system. Its main cutaneous feature is hypopigmented blaschkoid lesions, the reverse of LWNH.[9] In an extensive presentation, it may be difficult to determine if the abnormality is the hypopigmentation or the hyperpigmentation and both conditions are sometimes called pigmentary mosaicism.[5] Epidermal nevi differs from LWNH because of its hyperkeratotic plaques.[1] Mosaicism can be ruled out by karyotype.[9]

LWNH has been reported as a sporadic occurrence, although there has been one reported case of an affected mother and daughter.[10] In some cases, underlying chromosomal mosaicism and cytogenetic changes have been observed such as trisomy 7, 14, 18, 20 and X-chromosomal mosaicism.[1,2,5,11] A postzygotic mutation in KITLG gene was also identified.[8] The latter is associated with increased KITLG and c-KIT epidermal expression.[8]

LWNH may be associated with extracutaneous abnormalities including central nervous system diseases, cardiac defects, psychomotor delay, deafness, brachydactyly and hydrocephalus.[2] The true incidence of such associated

systemic features is unknown but some studies have reported a rate between 16% and 31%.[5]

Because of possible association with various congenital anomalies, LWNH patients should be thoroughly investigated.[1] Neurodevelopmental and psychomotor development should be closely monitored, as well as limb measurement and head circumference. Ophthalmic and audiologic evaluation should be carried out. Cerebral and heart imaging could be advised upon diagnosis or following symptomatology (Table 1).

Much remains to be known about LWNH. It is generally a benign condition but association with various congenital anomalies has been reported. To our knowledge, association of LWNH with Joubert syndrome has rarely been described. Proper work-up is advised in order to exclude congenital anomalies.

Authors' note

This paper was presented as a poster at the Canadian Dermatology Association Conference (June 2019).

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Informed consent

The patient provided signed informed consent for publication of the case report and images.

References

1. Mehta V, Vasanth V, Balachandran C, et al. Linear and whorled nevoid hypermelanosis. *Int J Dermatol* 2011; 50(4): 491–492.
2. Errichetti E, Pegolo E and Stinco G. Linear and whorled nevoid hypermelanosis: a case report with dermoscopic findings. *Indian J Dermatol Venereol Leprol* 2016; 82(1): 91–93.
3. Parisi M and Glass I. Joubert syndrome. *GeneReviews*, https://www.ncbi.nlm.nih.gov/books/NBK1325/#joubert.Molecular_Genetics (accessed 17 July 2019).
4. Brancati F, Dallapiccola B and Valente ME. Joubert syndrome and related disorders. *Orphanet J Rare Dis* 2010; 5(1): 20.
5. Di Lernia V. Linear and whorled hypermelanosis. *Pediatr Dermatol* 2007; 24(3): 205–210.
6. Choi JC, Yang JH, Lee UH, et al. Progressive cribriform and zosteriform hyperpigmentation – the late onset linear and whorled nevoid hypermelanosis. *J Eur Acad Dermatol Venereol* 2005; 19(5): 638–639.
7. Schepis C, Alberti A, Siragusa M, et al. Progressive cribriform and zosteriform hyperpigmentation: the late-onset feature of linear and whorled nevoid hypermelanosis associated with congenital neurological, skeletal and cutaneous anomalies. *Dermatology* 1999; 199(1): 72–73.
8. Sorlin A, Maruani A, Aubriot-Lorton M-H, et al. Mosaicism for a KITLG mutation in linear and whorled nevoid hypermelanosis. *J Invest Dermatol* 2017; 137(7): 1575–1578.
9. Romano C, Pirrone P, Siragusa M, et al. An additional case of linear and whorled nevoid hypermelanosis associated with birth defects and mental retardation. *Pediatr Dermatol* 1999; 16(1): 71–73.
10. Akiyama M, Aranami A, Sasaki Y, et al. Familial linear and whorled nevoid hypermelanosis. *J Am Dermatol* 1994; 30(5 Pt 2): 831–833.
11. Yao L, Zhou D-D and Lu C-W. Linear and whorled nevoid hypermelanosis. *Am J Med Sci* 2017; 353(1): e1.