Marijana C. Jandrić Kočič[1], Snežana Knežević[2]

HALO NEVUS

Summary: Halo nevus (leukoderma acquisitum centrifugum, Sutton's nevus, leukopigmentary nevus, perinevoid vitiligo or perinevoid leukoderma) is a melanocytic nevus surrounded by a halo of depigmentation. They are significantly more common in children and young people, with a peak incidence at the age of 15, without gender or racial predilection. The usual clinical course of a halo nevus involves gradual involution and subsequent complete regression of a centrally located nevus that leaves behind an area of depigmentation. Typical halo nevus do not require treatment. Exceptionally, halo nevus develop from dysplastic nevi and malignant skin neoplasms (halo phenomenon).

The paper shows a 12-year-old boy with changes on his back nevi. During last summer, a pale band developed around two nevi. The nevi themselves became lighter and smaller. One of them has completely disappeared. Apart from basal cell carcinoma in the father, the presence of other atypical nevi, melanoma, vitiligo and autoimmune diseases in the personal and family history was not established. A typical halo nevus is diagnosed by clinical and dermatological examination and regular dermatological monitoring is advised.

Halo nevi generally develop from an acquired melanocytic nevus, but can be seen in dysplastic nevi, basal cell carcinoma, and melanoma. A thorough medical history, careful clinical and dermatological examination allow identification of atypical halo nevi that require biopsy.

Key words: Nevus, halo, regression, depigmentation,

Introduction

Melanocytic nevus (MN) is a benign, well-circumscribed, proliferation of cells with melanocytic differentiation in the skin and mucous membrane[1-3]. MN is the most common form of nevus that develops in childhood and adolescence[3]. It is predomi-

[1] Marijana C. Jandrić Kočič, Health Center, Krupa na Uni, Republic of Srpska, Bosnia and Herzegovina, marijanajandrickocic@gmail.com.

[2] Academy of Applied Technical Studies Belgrade

nantly located in the basal epidermis (junctional MN) or dermis (dermal MN), rarely in deeper layers (deep penetrating MN)[1].

Halo nevus (HN) (leukoderma acquisitum centrifugum, Sutton's nevus, leukopigmentary nevus, perinevoid vitiligo or perinevoid leukoderma) is a melanocytic nevus surrounded by a halo (halo) of depigmentation[4]. The incidence of HN in the general population is estimated at around 1%[3,5]. They are significantly more common in children and young people, with a peak incidence at the age of 15, without gender or racial predilection[3,5,6].

The usual clinical course of HN involves gradual involution and subsequent complete regression of a centrally located nevus that leaves behind an area of depigmentation[3,7]. Although benign, HN can be associated with vitiligo[5,8]. In addition, the halo phenomenon can occur around malignant skin neoplasms, including melanoma and basal cell carcinoma[5].

Case report

Parents bring a 12-year-old boy to the family medicine clinic because of changes in the nevi on his back. Last summer, the parents noticed the development of a pale band around two nevi. Furthermore, the nevi became brighter and shrank. One of them has completely disappeared. My father had a basal cell carcinoma removed from the area of his nose. The presence of other atypical nevi, melanoma, vitiligo and autoimmune diseases in personal and family anamnesis was not established.

A clinical examination in the upper left quadrant of the back revealed the presence of an oval area of depidation (Figure 1). Below it is a circumscribed nevus, with peripheral illumination, of regular shape, 5 mm in diameter, surrounded by a peripheral, clearly defined, symmetrical depigmenoid band (Figure 2).

The boy is referred to a dermatologist who states a benign melanocytic nevus and advises regular dermatological monitoring.

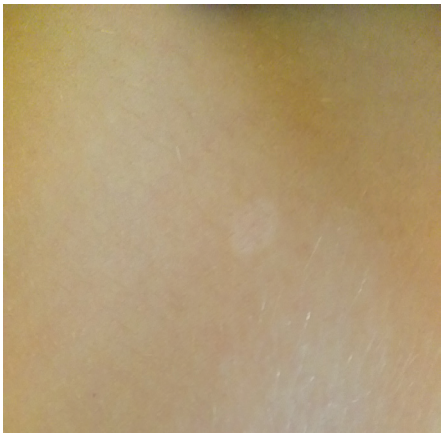

Figure 1. *Oval depigmentation at the site of an earlier halo nevus*

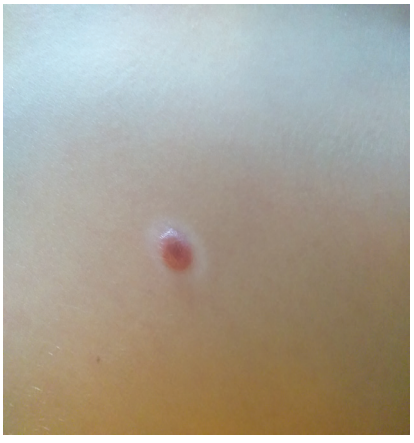

Figure 2. *Halo nevus*

Discussion

HN includes melanocytic nevi surrounded by a "halo" of depigmentation[5]. They predominantly occur in children and young adults[9]. They are not common in people over 40[9]. They are more present in people with a larger number of nevi and/or a personal or family history of vitiligo[6]. Very rarely, familial occurrence of HN has been observed[3,5].

HN are most often present on the upper back, head and neck, but can also be seen on other parts of the body[5,10]. If it is a nevus of the scalp, the hair in the area of the halo of hypopigmentation is white (polyosis)[10]. They are never observed on the mucous membrane, palms, soles and nail beds[3]. The number of HN can be different[3]. Two or more HNs have been described in 25-50% of affected individuals[3]. Occasionally, a large number of HN can occur simultaneously or consecutively[3].

HN, together with vitiligo and hypopigmentation associated with melanoma, belong to a group of dermatoses designated as immune leukoderma[9]. The pathophysiology of HN is still unknown[11]. The authors proposed two theories: the antibody theory and the cytotoxic T-cell response[9]. Antibody theory was abandoned considering the disappearance of activated and proliferating lymphocytes after excision of HN[9,11]. The theory of the cytotoxic T-cell response implies a cellular immune response caused by abnormal, possibly premalignant melanocytes within the HN or at some distance from the HN[5]. According to individual studies, the cellular immune response is induced by melanocytes with atypical nuclear changes "often" present in nevus spilus[12]. The immune response recognizes common antigens in both atypical and normal melanocytes[12]. Immune cross-reaction in a normal nevus explains the presence of multiple HN[12].

HN is a circumscribed, homogeneously colored nevus, with a regular shape, 3-6 mm in diameter, surrounded by a peripheral, clearly defined, symmetrical depigmenoid band[3]. The nevus is mostly an acquired melanocytic nevus[13]. Exceptionally, we are talking about congenital melanocytic nevus, blue nevus, Spitz nevus, verrucous nevus, Mongolian ptosis, neurofibroma, basal cell carcinoma and melanoma (halo phenomenon)[13]. The hypopigmented halo has an equal radial distance from the central nevus and a size of several millimeters to several centimeters[3]. Halo nevi show a characteristic clinical course that can be divided into four stages:

Stage I - the appearance of a white halo around the central nevus,

Stage II - lightening and "blushing" of the central nevus,

Stage III - progressive involution and consequent complete regression of the central nevus, which leaves a circular depigmented space,

Stage IV - depigmentation that can persist for years before melanocytes from the surrounding skin finally repopulate the space[3].

However, an unusual clinical evolution of HN with progressive darkening of the nevus component has been reported[3].

Dermoscopic examination of HN reveals globular and/or homogeneous patterns that characterize benign melanocytic nevi of children and young adults[14]. Histologically, four forms of HN have been described: inflammatory, non-inflammatory, HN without a halo of hypopigmentation or depigmentation, which is diagnosed histologically, and a halo phenomenon around a melanocytic nevus[15]. Inflammatory HN is predominantly present, characterized by the symmetrical distribution of a dense, lymphocytic infiltrate between the cells of the nevus in the dermis and loss of pigment at the dermo-epidermal border on the periphery of the nevus[3]. Mitoses are usually present, although apoptotic cells can be seen[3].

HN can coexist with other autoimmune conditions[5]. Vitiligo is present in 26% of people with HN[16]. It is believed that the association of HN and vitiligo is more common in people with a family history of autoimmune diseases[17]. Although it is not clear whether HN are predictors of vitiligo, the existence of a case report in which removal of HN in a girl resulted in improvement of concurrent periorbital vitiligo is significant[18]. Cases of coexistence of HN with autoimmune thyroiditis, Vogt Koyanagi-Harada syndrome, polio and pernicious anemia have also been published[5]. An increased presence of HN has been observed in individuals with Turner syndrome[5]. HN have been described in people treated with atezolizumab and ipilimumab[9]. Crucially, the sudden development of HN is associated with distant, occult cutaneous or ocular melanoma in adults[5]. Increased risk found in individuals with a single, unique HN and absence of personal and family history of vitiligo[6]. However, the overall association of HN in children and young adults is extremely low[5].

The diagnosis of HN requires a thorough personal and family history of the disease (presence of atypical nevi, melanoma and autoimmune diseases), careful clinical (presence of asymmetry, irregular edges, variegated colors, diameter > 6 mm, developing lesion) and dermoscopic examination (presence of crystalline structures , arborized blood vessels and atypical pigment network, absence of pigment network) of each HN[5]. Typical HN does not require biopsy, appropriate management is advised[5,7].

Although improvement has been described after treatment with topical calcineurin inhibitors, topical Janus kinase inhibitors, dermabrasion, and narrowband ultraviolet B phototherapy, treatment of HN is not advised[5].

Conclusion

HNs mostly develop from an acquired melanocytic nevus, but can be seen in dysplastic nevi, basal cell carcinoma, and melanoma. A thorough history, careful clinical and dermatological examination allow identification of atypical HNs that require biopsy.

Literature

1. Frischhut N, Zelger B, Andre F, Zelger BG. The spectrum of melanocytic nevi and their clinical implications. J Dtsch Dermatol Ges. 2022 Apr;20(4):483-504. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9320830/
2. Zanini M, Machado Filho CD, Paschoa FM Le Vocc F. Sutton's Nevus simulating cockade nevus: report of a case. An Bras Dermatol. 2004Nov;79(6):721–4. Available from: https://www.scielo.br/j/abd/a/VXdvdgFK6nFW9PTHb3qjKTz/?lang=en#
3. Tiodorović-Živković D. Povezanost strukturnog obrasca, distribucije pigmenta i boje melanocitnih nevusa odredjenih metodom dermoskopije sa tipom kože i uzrastom. Niš: Univerzitet u Nišu Medicinski fakultet. 2013. Available from: https://nardus.mpn.gov.rs/bitstream/handle/123456789/3922/Disertacija.pdf
4. Paller AS, Mancini AJ. Cutaneous Tumors and Tumor Syndromes. U: Hurwitz Clinical Pediatric Dermatology (Fifth Edition). London: Elsevier. 2016: 193-229. Available from: https://www.sciencedirect.com/topics/medicine-and-dentistry/halo-nevus
5. Jodi SY, Shehla A. Halo Nevi in athe Pediatric Population. Journal of the Dermatology Nurses' Association.2023;15(1):41-45. Available from: https://journals.lww.com/jdnaonline/fulltext/2023/01000/halo_nevi_in_the_pediatric_population.5.aspx
6. De Schrijver S, Theate I, Vanhooteghem O. Halo Nevi Are Not Trivial: About 2 Young Patients of Regressed Primary Melanoma That Simulates Halo Nevi. Case Reports in Dermatological Medicine. 2021;6672528. Available from: https://www.hindawi.com/journals/cridm/2021/6672528/
7. Lazarević V, Tiodorović J, Binić I, Popović D, Janković A. Halo nevus - prikaz slučaja. Acta medica Medianae. 2006;45(2):73-5. Available from: https://publisher.medfak.ni.ac.rs/AMM_1/amm-stari/2006-html/2-broj/HALO%20NEVUS-PRIKAZ%20SLUCAJA.pdf
8. Ramachandran V, Kim KM, Zhang L. Disseminated Nonsegmental Vitiligo Associated With Halo Nevi and Premature Gray Hair. Cureus. 2021 Mar 13;13(3):e13868. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8038926/
9. Nedelcu R, Dobre A, Brinzea A, Hulea I, Andrei R, Zurac S et al. Current Challenges in Deciphering Sutton Nevi—Literature Review and Personal Experience. Journal of Personalized Medicine. 2021;11(9):904. Available from.: https://doi.org/10.3390/jpm11090904
10. Tschen J, Rivera EIG, Arenas R. Halo Nevus (Sutton's Nevus Stage II) on the Scalp. A Case Report Associated to Superficial Spreading Melanoma. Dermatología-CMQ2017;15(2):90-95. Available from: https://www.medigraphic.com/pdfs/cosmetica/dcm-2017/dcm172f.pdf
11. Speeckaert R, van Geel N, Luiten RM, van Gele M, Speeckaert M, Lambert J et al. Melanocyte-specific Immune Response in a Patient with Multiple Regressing Nevi and a History of Melanoma.Anticancer Research. 2011 Nov;31(11):3697-3703. Available from: https://ar.iiarjournals.org/content/31/11/3697.long
12. Kim YY, Kim MY, Kim TY. Development of Halo Nevus Around Nevus Spilus as a Central Nevus, and the Concurrent Vitiligo. Ann Dermatol. 2008 Dec;20(4):237-9. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4903988/

13. Vera Sáez-Benito MC, Romagosa Sánchez-Monge B, de Dios Javierre B. Mastocitosis cutánea y halo nevus múltiples. Rev Pediatr Aten Primaria. 2020;22:387-90. Available from: https://scielo.isciii.es/scielo.php?script=sci_arttext&-pid=S1139-76322020000500011#B3
14. Kolm I, Di Stefani A, Hofmann-Wellenhof R, Fink-Puches R, Wolf IH, Richtig E et al. Dermoscopy Patterns of Halo Nevi. Arch Dermatol. 2006;142(12):1627–1632. Available from: https://jamanetwork.com/journals/jamadermatology/fullarticle/409966
15. Babu A, Bhat MR, Dandeli S, Ali NM. Throwing Light onto the Core of a Halo Nevus: A New Finding. Indian J Dermatol. 2016 Mar-Apr;61(2):238. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4817486/#ref6
16. Bishurul Hafi, NA; Bachaspatimayum, Romita; Soraisham, Ronibala; Muhammed, NCP1. Halo Nevi in Children: A Separate Entity or a Sign of Vitiligo?. Indian Journal of Paediatric Dermatology. 2019 Jul–Sep;20(3):227-230. Available from: https://journals.lww.com/ijpd/fulltext/2019/20030/halo_nevi_in_children__a_separate_entity_or_a_sign.6.aspx
17. Ezzedine K, Diallo A, Léauté-Labrèze C, et al. Halo Nevi Association in Nonsegmental Vitiligo Affects Age at Onset and Depigmentation Pattern. Arch Dermatol. 2012;148(4):497–502. Available from: https://jamanetwork.com/journals/jamadermatology/article-abstract/1150956
18. Wang K, Wang Z, Huang W. Resolution of vitiligo following excision of halo congenital melanocytic nevus: a rare case report. Dermatologic Therapy. 2016 May;29(3):145-147. Available from: https://europepmc.org/article/med/26627472