

Brief Report

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Brief Report

# Briefly Structural Analyze on Melanocytic Nevi

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**Abstract:** The purpose of the study is to analyze and also to identify specific structural characteristics of melanocytic nevi, to youth patients. Using the optical and electronic microscope, could be possible a proper description related melanocytic nevi. Disease diagnostic management and future trends, directions are also important key points. As future directions good to mention preventive and prophylactic methods.

**Keywords:** epiderm; youth nevi, analyze; management

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## Introduction

In order to define a disease, must have in attention a lot of different factors such as historical points, or social and cultural. Results of research studies, show us that some connective cells such as fibroblasts, lose their identity, in pathological conditions. [1] Another specific cells, namely melanocytes are known that having a specific structural point that is considered important in structural pathological description. [2] Referring to melanocytic nevi, in medical specific field of study and of research, various pigmented lesions of the epiderm, known as nevi, could be observed in different parts of the body. [3] For a proper diagnostic, an atypical nevus, can be biopsied. [4] In this direction, is important to practice a biopsy beside the extended clinical evaluation in melanocytic nevi. A great point in this field of research, could be possible the genetic susceptibility for morphological and functional alterations, in nevi with that surrounding nevi changes. [5] A complete medical examination, play a great point for establishing the medical conduct, for a healthy status improving. [6,7] Structural analysis describe specific cells namely melanocytes as aggregated in 'nests', which conduct forming the nevus cells. [8] To the youth patients researchers found specific cells knowing as melanocytes. This specific cells could be found in areas of the epiderm of the parts of the body. [9,10] Theoretical and practical studies, show that melanocytic nevi developing in utero present genetical differences from those that appear later. [11,12] In the present field, we can mention about various informations from scientific literature, referring to specific nevi. [13] Also from literature and from practicum actually are known different scientific informations about extending melanocytic nevi, having specific scientific names. [14] Because are many cases in all of the world, diagnosed as melanocytic nevi, we can mention that currently, the proper treatment of epidermal nevi is challenging. [15,16–18] Congenital melanocytic nevi it is known as a subject of research that offer controversy. [19] Clinical monitoring in congenital melanocytic nevi is important for diagnosis and for possible medical treatment strategies applications. [20] A complete examination of the human body, during a medical examination, is important. [21,22] Best to mention that the nowadays higher incidence in melanoma is in accompaniment of the nevi existence of the body and of the increase exposure to the ultraviolet light. [23,24] Practical biopsy is important for diagnosis. [25] One of an important point in the diagnosis of melanocytic nevi is to differentiate melanocytic nevi from a possible melanoma. [26,27]. An earlier diagnosis of the melanoma play a great role in idea that neoplastic lesions could be develop from pre-existing nevi in many cases. [28] Unfortunately, the epidermal melanoma is growing faster., depending of various conditions. [29,30]

## Melanocytic Nevi Considerations

From many types of nevi, in the next short written text, we will describe a little bit on Ito's nevus and Ota's nevus. These two types of nevi could be observed in pregnancy, at birth and also at puberty. Their presence is in concordance with hormonal changes. Research studies described possible malignant status in Ota's nevus, rarely in Ito's nevus. [31,32] These two previously mentioned types of nevi, namely Ito and Ota, do not differ from a histological point of view. Ito's nevus and Ota's nevus are distinguished by specific location on the body. So, typically, Ito's nevus occurs in the arm region and Ota's nevus could be found on the face. [33,34] Ota's nevus could also be found in the supply areas of the first two branches of the trigeminal nerve. [34,35–37] Structurally, Ito's nevus presents as a slate-blue/gray-blue macula in the shoulder/breast and lateral arm region in the supply area of the brachial nerve, in infants or prior to puberty. [38] It is known that a specific sign of melanoma within the existing Ito's nevus is a typical nodule. [39] In rarely malignant cases in patients diagnosed with Ito's nevi have been reported in addition, typical nodules. [40,41]

From birth age, congenital melanocytic nevi (CMN) are known as one of the frequent skin lesions. [42] From research results and conclusions, it could be found rarely medical, namely neurofibromatosis, differentiation. To a specific analysis, it is possible to observe specific areas of cells with myxoid stroma in addition. Possible resemble later than, as neurofibromas. [42]

From a current research perspective we can mention that in utero, specific stem cells from the neuroectoderm play a significant role such as migration to the skin as melanoblasts. Mechanism refers to a differentiation process into melanocytes. In addition, mutations arising in specific cells can occur to well known mosaicism. Good to know that in the early embryogenesis, multipotent progenitor cells can be affected, leading to the presence of multiple congenital melanocytic nevi and also to extracutaneous alterations. [43,44]

In addition to the previously mentioned idea, congenital melanocytic nevi occur as a result of in-utero somatic mutations. In this idea, genes play a great role. So there are known the mitogen-activated protein kinase (MAPK) pathway (mainly NRAS and BRAF). More than, their specific mutations refer to damages in the development of cutaneous and/or extracutaneous previously mentioned mosaicism. [45] Additionally to congenital melanocytic nevi, proliferative nodules (PN) constitute nodular lesions. [46] All described epidermal alterations, are factors incriminated in differentiating proliferative nodules from melanoma.

Good to mention that neurocutaneous melanosis is a disease where congenital melanocytic nevi are associated with melanocyte proliferation. Besides, satellite lesions are especially at risk. Clinically are signs and specific symptoms. So could be describe neurological symptoms, with possible intracranial pressure. [47] From literature data there are known a lot of types of melanocytic nevi. [48] Then possible surgical intervention and pathological diagnosis we can take into consideration. [49] Management directions play also a significant role as future directions. [50]

## Material and Methods

For the purpose of the study we can mention about classic laboratory technique used and about the materials needed. In the specific laboratory, were followed the steps of the classic method, using Hematoxylin & Eosin staining. The samples used were from male and female youth patients, before mature age, from urban and rural residence. These are examined by performing the optical microscopic analysis. The operative pieces are intended to bring in the pathological anatomy service for macroscopic examination for diagnostic purposes.

## Results

Epidermis protect us during the life, from different factors. For a morphological analysis, structural and ultrastructural characteristics could be described, using optical and electron microscope. Structural analysis of the epidermis, using colour laboratory techniques, is able to describe the specific layers with their characteristics. More than, using electron microscope, specific compounds as

filaggrin which is known as an important epidermal protein and/or tight junction located in the granular layer of the epiderm, could be observed. For this purpose, transmission electron microscope examination, is considered one proper method for analysis. Scanning electron microscopy is also a modern method for analysis, which offers results that demonstrate abnormalities in the epiderm ultrastructure. The human body is covered by skin and the epiderm contains different types of glands, as sebaceous glands and sudoripar glands. In this study direction, it is known a typical physiopathologic mechanism for the functionality of the body, including epidermal compounds and their body surroundings. Histopathological analysis describes various modifications to the melanocytic nevi aspect, located on various regions of the body. So we can mention asymmetry, irregular form, cytologic atypia, and mitotic activity. Medical specialists, describe and conclude that to benign melanocytic nevi, could be possible a description for atypical pathological characteristics of nevi and more important to mention characteristics when benign nevi are traumatized. Epiderm is a barrier, but is able for conducting to an illness status if include modifications in structural compounds. Histopathological analysis describes the melanocytic nevi located on various regions of the body, with asymmetry, irregular form, cytologic atypia and mitotic activity. More than, medical specialists, describe and conclude related to the structural aspects in benign traumatized melanocytic nevi. In this field, dermoscopy play a role for a proper diagnostic. Dermoscopy play a role for a proper diagnostic important in practice to all ages, including, youth age and children.

## Discussions

Great interest in knowing epidermal compounds. So, the epiderm, is composed of a number of specific layers. Specific cells are known. One of the role of the epiderm is implication in different injuries. Alterations in the compounds of the epiderm layers, contribute to the visual signs of pathologic conditions. One research direction, refer to the role of benign melanocytic lesions with alterations, which conduct to malignant cutaneous melanoma. Related to melanocytic nevi, in some circumstances, could be possible that the prognosis be poor having in attention the healthy of the patients having comorbidities. Pathological analysis and diagnosis referring to melanocytic nevi located on different regions from the body can find asymmetry, irregularity, cytologic atypia, and mitotic activity. Medical team including dermatologists, pathologists and dermatopathologists play a great role, in idea referring to differentiate benign melanocytic nevi from malignant melanoma. This is important in order to avoid unnecessary surgical intervention or a treatment. Management and a better clinical evaluation, is a key point for a proper next time abatement in epidermal pathologically compounds as nevi. Structural analysis to the epidermal alterations is important for diagnosis. Next point is dermatological diagnosis.

## Conclusions

Techniques for the laboratory diagnosis, as a key point in monitoring pathological status to patients diagnosed with melanocytic nevi, conduct to a proper quality of life. Implication of an interprofessional team is a condition that play a great medical role. Congenital melanocytic nevi are pigmented lesions that are usually present at birth. They are generally benign, but a small percentage (especially the larger ones) can potentially transform into malignant melanoma. Future trends, new laboratory methods and techniques for diagnosis. are in attention, for the next coming period of time.

## References

1. Salzer M.C., Lafzi A., Berenguer-Llargo A., Youssif C., Castellanos A., Solanas G., Peixoto F.O., Stephan-Otto Attolini C., Prats N., Aguilera M., Martín-Caballero J., Heyn H., Benitah S.A. Identity noise and adipogenic traits characterize dermal fibroblast aging. *Cell*. 2018;175:1575–1590.e22.
2. Palicka GA, Rhodes AR. Acral melanocytic nevi: prevalence and distribution of gross morphologic features in white and black adults. *Arch Dermatol*. 2010 Oct;146(10):1085-94.

3. Wang M, Xu Y, Wang J, Cui L, Wang J, Hu XB, Jiang HQ, Hong ZJ, Yuan SM. Surgical Management of Plantar Melanoma: A Retrospective Study in One Center. *J Foot Ankle Surg.* 2018 Jul-Aug;57(4):689-693.
4. Richtig E. ASCO Congress 2018: melanoma treatment. *Memo.* 2018;11(4):261-265.
5. Wang B, Qu XL, Chen Y. Identification of the potential prognostic genes of human melanoma. *J Cell Physiol.* 2019 Jun;234(6):9810-9815.
6. Bristow I, Bower C. Melanoma of the Foot. *Clin Podiatr Med Surg.* 2016 Jul;33(3):409-22.
7. Lallas A, Kyrgidis A, Koga H, Moscarella E, Tschandl P, Apalla Z, Di Stefani A, Ioannides D, Kittler H, Kobayashi K, Lazaridou E, Longo C, Phan A, Saida T, Tanaka M, Thomas L, Zalaudek I, Argenziano G. The BRAAFF checklist: a new dermoscopic algorithm for diagnosing acral melanoma. *Br J Dermatol.* 2015 Oct;173(4):1041-9.
8. Tronnier M. Melanotische Flecke und melanozytäre Nävi. In: Plewig G, Ruzicka T, Kaufmann R, Hertl M. *Braun-Falcos Dermatol. Venerol. Allergol.* Springer Berlin Heidelberg, 7. Auflage, 2016.
9. Tolleson WH. Human Melanocyte Biology, Toxicology, and Pathology. *J Environ Sci Health Part C* 2005; 23: 105–61.
10. Thomas AJ, Erickson CA. The making of a melanocyte: the specification of melanoblasts from the neural crest. *Pigment Cell Melanoma Res* 2008; 21: 598–610.
11. Colebatch AJ, Ferguson P, Newell F et al. Molecular genomic profiling of melanocytic nevi. *J Invest Dermatol* 2019; 139: 1762–8.
12. Kinsler VA, Thomas AC, Ishida M et al. Multiple congenital melanocytic nevi and neurocutaneous melanosis are caused by postzygotic mutations in codon 61 of NRAS. *J Invest Dermatol* 2013; 133: 2229–36.
13. Bandyopadhyay D. Halo nevus. *Indian Pediatr* 2014; 51: 850.
14. Fernandez-Flores A. Eponyms, Morphology, and Pathogenesis of some less mentioned types of melanocytic nevi. *Am J Dermatopathol* 2012; 34: 607–18.
15. Kim JJ (Department of Dermatology, Henry Ford Health System, Detroit, MI 48202, USA), Chang MW, Shwayder T. Topical tretinoin and 5-fluorouracil in the treatment of linear verrucous epidermal nevus. *J Am Acad Dermatol.* 2000 Jul;43(1 Pt 1):129–132.
16. Brown HM, Gorlin RJ. Oral mucosal involvement in nevus unius lateris (Ichthyosis Hysterix). *Arch Dermatol.* 1960 Apr;81:509–515.
17. Zvulunov A (Soroka Medical Center, Ben-Gurion University, Beer-Sheva Israel), Grunwald MH, Halvy S. Topical calcipotriol for treatment of inflammatory linear verrucous epidermal nevus. *Arch Dermatol.* 1997 May;133(5):567–568.
18. Boyce S (Washington Institute of Dermatologic Laser Surgery, Washington, DC 20037, USA), Alster T. CO2 laser treatment of epidermal nevi: Long-term success. *Dermatol Surg.* 2002 Jul;28(7):611–614.
19. Arad E, Zuber M, Ronald, The shifting paradigm in the management of giant congenital melanocytic nevi: review and clinical applications, *Plast Reconstr Surg.*, 2014 Feb;133(2):367-376.
20. Mologousis MA, Tsai SY, Tissera KA, Levin YS, Hawryluk EB., Updates in the Management of Congenital Melanocytic Nevi., *Children (Basel).* 2024 Jan 2;11(1):62.
21. Bristow I, Bower C. Melanoma of the Foot. *Clin Podiatr Med Surg.* 2016 Jul;33(3):409-22.
22. Lallas A, Kyrgidis A, Koga H, Moscarella E, Tschandl P, Apalla Z, Di Stefani A, Ioannides D, Kittler H, Kobayashi K, Lazaridou E, Longo C, Phan A, Saida T, Tanaka M, Thomas L, Zalaudek I, Argenziano G. The BRAAFF checklist: a new dermoscopic algorithm for diagnosing acral melanoma. *Br J Dermatol.* 2015 Oct;173(4):1041-9.
23. Bartoš V, Kullová M. Malignant Melanomas of the Skin Arising on the Feet. *Klin Onkol.* 2018 Summer;31(4):289-292.
24. Palicka GA, Rhodes AR. Acral melanocytic nevi: prevalence and distribution of gross morphologic features in white and black adults. *Arch Dermatol.* 2010 Oct;146(10):1085-94.
25. Bristow IR, de Berker DA, Acland KM, Turner RJ, Bowling J. Clinical guidelines for the recognition of melanoma of the foot and nail unit. *J Foot Ankle Res.* 2010 Nov 01;3:25.
26. Gershenwald JE, Ross MI. Sentinel-lymph-node biopsy for cutaneous melanoma. *N Engl J Med.* (2011) 364:1738–45. 10.1056/NEJMc1002967.

27. Eggermont AM, Spatz A, Robert C. Cutaneous melanoma. *Lancet*. (2014) 383:816–27. 10.1016/S0140-6736(13)60802-8 .
28. Elder DE. Precursors to melanoma and their mimics: nevi of special sites. *Mod Pathol*. (2006) 19(Suppl. 2):S4–20. 10.1038/modpathol.3800515.
29. Gershenwald JE, Ross MI. Sentinel-lymph-node biopsy for cutaneous melanoma. *N Engl J Med*. (2011) 364:1738–45. 10.1056/NEJMct1002967.
30. Eggermont AM, Spatz A, Robert C. Cutaneous melanoma. *Lancet*. (2014) 383:816–27. 10.1016/S0140-6736(13)60802-8.
31. van Krieken JH, Boom BW, Scheffer E. Malignant transformation in a naevus of Ito. A case report. *Histopathology* 1988; 12: 100–2.
32. Wise SR, Capra G, Martin P et al. Malignant melanoma transformation within a nevus of Ito. *J Am Acad Dermatol* 2010; 62: 869–74.
33. Pérez ME, Bley C, Cárdenas C. Nevus of Ota, a classic presentation. *Med Clin (Barc)* 2019; 153: 92.
34. Agarwal P, Patel BC. Nevus of Ota and Ito. *StatPearls* 2020.
35. Kang HY, Kang WH. Bilateral type of nevus of Ota presenting as agminated lentiginos. *Eur J Dermatol EJD* 2003; 13: 205–6.
36. Turnbull JR, Assaf C, Zouboulis C, Tebbe B. Bilateral naevus of Ota: a rare manifestation in a Caucasian. *J Eur Acad Dermatol Venereol JEADV* 2004; 18: 353–5.
37. Hori Y, Kawashima M, Oohara K, Kukita A. Acquired, bilateral nevus of Ota-like macules. *J Am Acad Dermatol* 1984; 10: 961–4.
38. Que SKT, Weston G, Suchecki J, Ricketts J. Pigmentary disorders of the eyes and skin. *Clin Dermatol* 2015; 33: 147–58.
39. Martínez-Peñuela A, Iglesias ME, Mercado MR et al. Malignant transformation of a nevus of Ito: description of a rare case. *Actas Dermosifiliogr* 2011; 102: 817–20.
40. Wise SR, Capra G, Martin P et al. Malignant melanoma transformation within a nevus of Ito. *J Am Acad Dermatol* 2010; 62: 869–74.
41. Martínez-Peñuela A, Iglesias ME, Mercado MR et al. Malignant transformation of a nevus of Ito: description of a rare case. *Actas Dermosifiliogr* 2011; 102: 817–20.
42. Zayour M, Lazova R. Congenital melanocytic nevi. *Clin Lab Med*. 2011 Jun;31(2):267-80.
43. Schaffer JV. Update on melanocytic nevi in children. *Clin Dermatol*. 2015 May-Jun;33(3):368-86.
44. Kinsler VA, O'Hare P, Bulstrode N, Calonje JE, Chong WK, Hargrave D, Jacques T, Lomas D, Sebire NJ, Slater O. Melanoma in congenital melanocytic naevi. *Br J Dermatol*. 2017 May;176(5):1131-1143.
45. Price HN. Congenital melanocytic nevi: update in genetics and management. *Curr Opin Pediatr*. 2016 Aug;28(4):476-82.
46. Vergier B, Laharanne E, Prochazkova-Carlotti M, de la Fouchardière A, Merlio JP, Kadlub N, Avril MF, Bodemer C, Lacoste C, Boralevi F, Taieb A, Ezzedine K, Fraitag S. Proliferative Nodules vs Melanoma Arising in Giant Congenital Melanocytic Nevi During Childhood. *JAMA Dermatol*. 2016 Oct 01;152(10):1147-1151.
47. Flores-Sarnat L. Neurocutaneous melanocytosis. *Handb Clin Neurol*. 2013;111:369-88.
48. Bandyopadhyay D. Halo nevus. *Indian Pediatr* 2014; 51: 850
49. Bristow IR, de Berker DA, Acland KM, Turner RJ, Bowling J. Clinical guidelines for the recognition of melanoma of the foot and nail unit. *J Foot Ankle Res*. 2010 Nov 01;3:25.
50. Richtig E. ASCO Congress 2018: melanoma treatment. *Memo*. 2018;11(4):261-265.

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