

ACANTHOSIS NIGRICANS – A CASE REPORT

Dr. Karthik Shunmugavelu¹ & Dr. Evangeline Cynthia Dhinakaran²

¹*Mercy Multispeciality Dental Centre, 8/27, Parvathipuram 1st street, Thiruneermalai main road, Chrompet, Chennai,
Tamilnadu, India*

²*Sree Balaji Medical College and Hospital, Chrompet, Chennai, Tamilnadu, India*

ABSTRACT

Acanthosis nigricans might be a systemic manifestation with cutaneous origin. They can be caused by metabolic disorders, genetic disorders, autoimmune disorders etc where the characteristic feature is hyperkeratosis. This article describes an incidental finding of acanthosis nigricans.

KEYWORDS: *Acanthosis Nigricans, Hyperkeratosis, Hyperinsulinemia*

Article History

Received: 02 Dec 2024 | Revised: 07 Dec 2024 | Accepted: 12 Dec 2024

INTRODUCTION

Clinical Case

A twenty-eight-year-old male patient complained of a burning sensation on the dorsal surface of the tongue for the past 2 months. Intraoral examination revealed depapillation and numerous diffuse papillary projections on the dorsal surface of the tongue (Figure A). Clinical examination revealed hyperkeratotic asymptomatic brown patches in the interphalangeal joints and the feet (Figure B, C). Laboratory investigations revealed hyperinsulinemia. Diagnosis of Acanthosis Nigricans was given.

Review of Literature

This disorder involves cutaneous structures. Clinical features include hard, heavily pigmented plaques of the extensor, flexor and intertriginous areas of the skin. Acanthosis Nigricans was proposed by Unna. Pollitzer and Janovsky observed the first case in 1891^{3,22,23,24}

CLASSIFICATION

Various classifications have been proposed based on the sites involved, etiology and clinicopathological correlation^{2,3,24}

- Curth classification – benign, malignant and pseudo
- Classification of Hernandez and Perez – simple and paraneoplastic
- Popa classification – metabolic, genetic, autoimmune, paraneoplastic, iatrogenic, idiopathic and mixed

ETIOLOGY

Metabolic Dysfunction

Insulin resistance plays an important role in obese patients.^{5,16}

Genetics

Unilateral lesions appear in the thighs, back and umbilical area. It stabilizes or recedes after continuous progress till puberty. There is no age predilection^{9,11,12}

Autoimmunity

The susceptible category involves positivity for antinuclear antibodies (ANA), antimicrobial antibodies (AMA) and/or increased immunoglobulin levels.^{17,18,27}

Paraneoplasticity

Lesions of benign and malignant nature can be differentiated. Associated pruritis with a rapid onset is seen.^{3,26}

Iatrogenic Causes

Pituitary extract, stilbestrol, oestrogen, oral contraceptives, glucocorticoids, niacin, hyperinsulinaemia and growth hormone.^{3,7}

Idiopathic

Seen in healthy, dark-skinned individuals in relation to dorsal surfaces of the hands, feet, elbows, knees and knuckles^{1,19}

Mixed-Type

Combination of two or more of the above-mentioned types³

CLINICAL FEATURES

Pigmented areas of brown, grey and black are seen. Hard and velvety texture regions are felt. Wart-like malformations are also seen. Lesions are occasionally pruritic and are symmetrically distributed. In children neck is the most affected site(99%) in comparison to axillae (73%). The facial region, upper limbs, lower limbs, umbilicus and genitalia are also involved. Oral manifestations appear as diffuse, papillary areas of mucosal alteration that commonly involve the tongue and upper lip^{10,13,23}

HISTOPATHOLOGICAL FEATURES

Pathognomonic features include increased keratosis, melanocyte proliferation in the epidermal basal layer, folding of the epidermal layer and leukocyte infiltration.^{20,24,25}

DIFFERENTIAL DIAGNOSES

Middle-aged women exhibit red to brown keratotic papules and plaques in relation to axillae, inguinal and submammary folds in intertriginous granular parakeratosis. Facial dermatoses and multiple verrucous lesions are observed on sun-exposed skin which is characterised by rosacea in Haber syndrome. Soft fibromas and follicular hyperkeratosis are associated with brown to black pigmentation in Dowling-Degos disease. Epidermal ridge interruption in association with

freckle pigmentation on the dorsal surface of hands and palmar pits is seen in Kitamura acropigmentation reticularis.²³

TREATMENT AND PROGNOSIS

Avoidance of risk factors and management of systemic disorder forms the main therapy. Secondary control includes topical, oral agents and esthetic correction. Exercise increase and reduce insulin levels. Correction of hyperinsulinemia leads to the reduction of hyperkeratotic lesions. Keratolytic agents are used in the management of benign forms^{4,6,8,14,15,21,28}

REFERENCES

1. Bishnoi A and Parsad D: Velvety hyperpigmentation on hands and feet of a young girl: Acral acanthosis nigricans. *J Cutan Med Surg*, 2018;22: 323.
2. Burke JP, Hale DE, Hazuda HP, Stern MP. A quantitative scale of acanthosis nigricans. *Diabetes Care* 1999; 22:1655-9.
3. Das A, Datta D, Kassir M, Wollina U, Galadari H, Lotti T, Jafferany M, Grabbe S, Goldust M. Acanthosis nigricans: A review. *J Cosmet Dermatol*. 2020 Aug;19(8):1857-1865.
4. EPSTEIN E. Podophyllin therapy in acanthosis nigricans. *J Invest Dermatol*. 1951 Jul;17(1):7. doi: 10.1038/jid.1951.55. PMID: 14850774.
5. González-Saldivar G, Rodríguez-Gutiérrez R, Ocampo-Candiani J, González-González JG, Gómez-Flores M. Skin Manifestations of Insulin Resistance: From a Biochemical Stance to a Clinical Diagnosis and Management. *Dermatol Ther (Heidelb)*. 2017 Mar;7(1):37-51. doi: 10.1007/s13555-016-0160-3. Epub 2016 Dec 5. PMID: 27921251; PMCID: PMC5336429.
6. Gregoriou S, Anyfandakis V, Kontoleon P, Christofidou E, Rigopoulos D, Kontochristopoulos G. Acanthosis nigricans associated with primary hypogonadism: Successful treatment with topical calcipotriol. *J Dermatolog Treat* 2008; 19:373-5.
7. Hartman R, Defelice T, Tzu J, Meehan S, Sanchez M. Acanthosis nigricans in the setting of niacin therapy. *Dermatol Online J*. 2011 Oct 15;17(10):11. PMID: 22031637.
8. Hermanns-Lê T, Scheen A, Piérard GE. Acanthosis nigricans associated with insulin resistance: pathophysiology and management. *Am J Clin Dermatol*. 2004;5(3):199-203. doi: 10.2165/00128071-200405030-00008. PMID: 15186199.
9. Innaurato S, Brierley GV, Grasso V, Massimi A, Gaudino R, Sileno S, Bernardini S, Semple R, Barbetti F. Severe insulin resistance in disguise: A familial case of reactive hypoglycemia associated with a novel heterozygous INSR mutation. *Pediatr Diabetes*. 2018 Jun;19(4):670-674. doi: 10.1111/pedi.12632. Epub 2018 Feb 7. PMID: 29411486.
10. James WD Elston DM Berger TG Andrews GC. *Andrews' Diseases of the Skin: Clinical Dermatology*. 11th ed. London: Saunders Elsevier; 2011. <http://www.clinicalkey.com/dura/browse/bookChapter/3-s2.0-C20090604396>. Accessed June 27 2023.

11. Jeong JS, Lee JY, Yoon TY. Unilateral nevoid acanthosis nigricans with a submammary location. *Ann Dermatol.* 2011 Feb;23(1):95-7. doi: 10.5021/ad.2011.23.1.95. Epub 2011 Feb 28. PMID: 21738374; PMCID: PMC3120010.
12. Jeong KH, Oh SJ, Chon S, Lee MH. Generalized acanthosis nigricans related to type B insulin resistance syndrome: a case report. *Cutis.* 2010 Dec;86(6):299-302. PMID: 21284281.
13. Judge MR, McLean WH, Munro CS. Disorders of keratinization. In: Burns T, Breathnach S, Cox N, Griffiths C, editors. *Rook's Textbook of Dermatology.* 8th ed. UK: Blackwell Publishing; 2010; 119-20
14. Kapoor S. Diagnosis and treatment of Acanthosis nigricans. *Skinmed.* 2010 May-Jun;8(3):161-4; quiz 165. PMID: 21137622.
15. Katz RA. Treatment of acanthosis nigricans with oral isotretinoin. *Arch Dermatol.* 1980 Jan;116(1):110-1. PMID: 7352756.
16. Khokhar A, Chin V, Perez-Colon S, Farook T, Bansal S, Kochummen E, Umpaichitra V. Differences between Metabolically Healthy vs Unhealthy Obese Children and Adolescents. *J Natl Med Assoc.* 2017 Autumn;109(3):203-210. doi: 10.1016/j.jnma.2017.02.008. Epub 2017 Apr 6. PMID: 28987250.
17. Kim HN, Fesseha B, Anzaldi L, Tsao A, Galiatsatos P, Sidhaye A. Antibody-Mediated Extreme Insulin Resistance: A Report of Three Cases. *Am J Med.* 2018 Jan;131(1):102-106. doi: 10.1016/j.amjmed.2017.08.004. Epub 2017 Aug 16. PMID: 28822702.
18. Kondo Y, Umegaki N, Terao M, Murota H, Kimura T, Katayama I. A case of generalized acanthosis nigricans with positive lupus erythematosus-related autoantibodies and antimicrosomal antibody: autoimmune acanthosis nigricans? *Case Rep Dermatol.* 2012 Jan;4(1):85-91. doi: 10.1159/000337751. Epub 2012 Mar 30. PMID: 22649336; PMCID: PMC3362225.
19. Kura MM, Sanghavi SA. Acral Acanthosis Nigricans in a Case of Scleroderma. *Indian J Dermatol.* 2015 Jul-Aug;60(4):423. doi: 10.4103/0019-5154.160540. PMID: 26288450; PMCID: PMC4533581.
20. Kutlubay Z, Engin B, Bairamov O, Tüzün Y. Acanthosis nigricans: A fold (intertriginous) dermatosis. *Clin Dermatol.* 2015 Jul-Aug;33(4):466-70. doi: 10.1016/j.clindermatol.2015.04.010. Epub 2015 Apr 8. PMID: 26051063.
21. Lahiri, Koushik & Malakar, Subrata. (1996). Topical tretinoin in acanthosis nigricans. *Indian Journal of Dermatology, Venereology and Leprology.* 62. 159-61.
22. Patel NU, Roach C, Alinia H, Huang WW, Feldman SR. Current treatment options for acanthosis nigricans. *Clin Cosmet Investig Dermatol.* 2018 Aug 7;11:407-413. doi: 10.2147/CCID.S137527. PMID: 30122971; PMCID: PMC6086114.
23. Phiske MM. An approach to acanthosis nigricans. *Indian Dermatol Online J.* 2014 Jul;5(3):239-49. doi: 10.4103/2229-5178.137765. PMID: 25165638; PMCID: PMC4144206.

24. Popa ML, Popa AC, Tanase C, Gheorghisan-Galateanu AA. Acanthosis nigricans: To be or not to be afraid. *Oncol Lett.* 2019 May;17(5):4133-4138. doi: 10.3892/ol.2018.9736. Epub 2018 Nov 19. PMID: 30944606; PMCID: PMC6444334.
25. Puri N. A study of pathogenesis of acanthosis nigricans and its clinical implications. *Indian J Dermatol.* 2011 Nov;56(6):678- 83. doi: 10.4103/0019-5154.91828. PMID: 22345770; PMCID: PMC3276896.
26. Schwartz RA. Acanthosis nigricans. *J Am Acad Dermatol.* 1994 Jul;31(1):1-19; quiz 20-2. doi: 10.1016/s0190-9622(94)70128-8. PMID: 8021347.
27. Sturmer RA, Denning S, Marchase P. Acanthosis nigricans and autoimmune reactivity. *JAMA.* 1981 Aug 14;246(7):763-5. PMID: 7253140.
28. Zayed A, Sobhi RM, Abdel Halim DM. Using trichloroacetic acid in the treatment of acanthosis nigricans: a pilot study. *J Dermatolog Treat.* 2014 Jun;25(3):223-5. doi: 10.3109/09546634.2012.674194. Epub 2012 Jun 10. PMID: 22494198.
29. Harizia, A. B. D. E. L. K. A. D. E. R., and S. A. L. A. H. E. D. D. I. N. E. Doumandji. "Biological activity of Nerium oleander L.(Apocynaceae) essential oil on 5th larval stage of Schistocerca gregaria (Forskål, 1775)(Orthoptera: Acrididae)." *International Journal of Zoology and Research* 4.6 (2014): 19-28.
30. Niswade, Dr Grishmi. "Syndromes And Periodontal Disease-An Insight!" *International Journal of Medicine and Pharmaceutical Science (IJMPS)* 11 2 (2021), 35 40.
31. Singh, Shilpi, et al. "Hypoglycemic profile of Gymnemic Acid and Glycyrrhizic Acid on high fructose diet related obesity induced diabetes." *International Journal of Medicine and Pharmaceutical Science (IJMPS) ISSN (P)* (2016): 2250-0049.

CAPTIONS TO ILLUSTRATIONS



Figure A: Depapillation and Numerous Diffuse Papillary Projections on the Dorsal Surface of the Tongue



Figure B: Hyperkeratotic Brown Patches in the Interphalangeal Joints



Figure C: Hyperkeratotic Brown Patches on the Feet