CASE REPORT

Reticulate acropigmentation of Kitamura: Clinical case report

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ABSTRACT

Reticulate Acropigmentation of Kitamura (RAK) is a rare autosomal dominant genodermatosis with variable penetrance. A prevalence of less than one per 100,000 is observed; to date there are only 130 published cases. Lesions appear as slightly depressed lentiginous and hyperpigmented macules with reticular arrangement, located on the dorsal side of the hands and feet. Over time, they may extend proximally as they become hyperpigmented, proportionally to the time of evolution and sun exposure.

Diagnosis is based on family, clinical and histopathological pathological medical history.

So far there are no defined criteria for this disease, so exhaustive studies and complementary tests must be carried out.

A 16-year-old female patient presents with 2-week hyperpigmented brownish macules located on the right hand, which progressively spread to the contralateral hand. These lesions, of reticulated appearance, have affected the dorsum of the 1st, 2nd and 3rd finger of both hands, symmetrically and bilaterally, extending to the wrists. RAK was considered. Histopathology finally confirmed its diagnosis.

INTRODUCTION

Reticulate pigmentary of Kitamura disorders are a group of pathologies that include hereditary reticulate pigmentary dermatoses (Kitamura, Dowling-Degos, Dohi, Haber's syndrome, Galli Galli Disease), presenting with hyperchromic macules, with morphology similar to ephelides, with coloration and variable sizes.[1] These types of disorders are characterized by confluent hypo or hyperpigmented patches, with a tendency to form network or reticular patterns.[2] For the most part, their association with one or more specific loci has been detected:

- Dowling-Degos Disease
  - Type 1 (KRT5 at 12q13.13).
  - Type 2 (POFUT1 on 20q11).
  - Type 3 (17p33.3).
  - Type 4 (POGLUTI in 3q13).

- Hereditary symmetrical dyschromatosis or reticulate acropigmentation of Dohi (ADAR in 1q21).
- Galli-Galli disease (KRT5 at 12q13.13).
- Haber's syndrome
- Reticulate acropigmentation of Kitamura

Reticulate acropigmentation of Kitamura (RAK) is a rare genodermatosis, characterized by lentiginous acral pigmentation, that affects mainly to Japanese.[3]

It was described by Kitamura and Akamatsu in 1943, with autosomal dominant inheritance and variable penetrance.[4] In 2013, it was revealed that it is caused by mutations in the ADAM10 gene, located on chromosome 15q21.3.[5]

CLINICAL CASE

16-year-old female patient coming from Guayaquil-Ecuador, with no significant personal or family medical history. She presented with 2-week hyperpigmented brownish macules located on the right hand, progressively spreading to the contralateral hand. These lesions, of reticulate appearance, affected the dorsum of the 1st, 2nd and 3rd finger of both hands, symmetrically and bilaterally, moving up towards the wrists. (Figure 1). Dermoscopy revealed small patches of a fine network of brownish pigment. (Figure 2).

A skin biopsy was performed, which revealed an epidermis with focal elongation and melanin overload of the interpapillary ridges reaching the follicular infundibulum (figure 3). The underlying dermis exhibited mild papillomatosis; lesions being compatible with Reticulate Acropigmentation of Kitamura.

DISCUSSION

Reticulate acropigmentation of Kitamura (RAK) is a rare genodermatosis. Most of the cases have been found in Japanese, although there have been other reports in other parts of the world.[6]

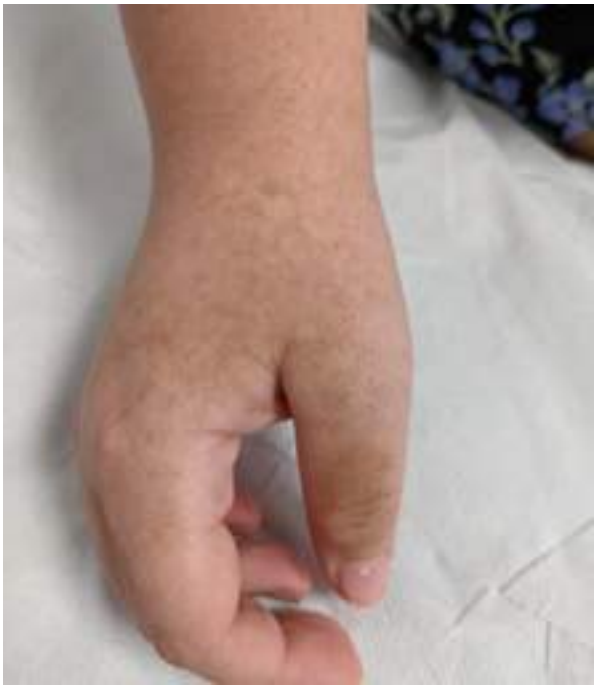

Figure 1.Reticulate brown hyperpigmented macules on the dorsum of the hand.

Figure 2. Fine network patches of brown pigment.

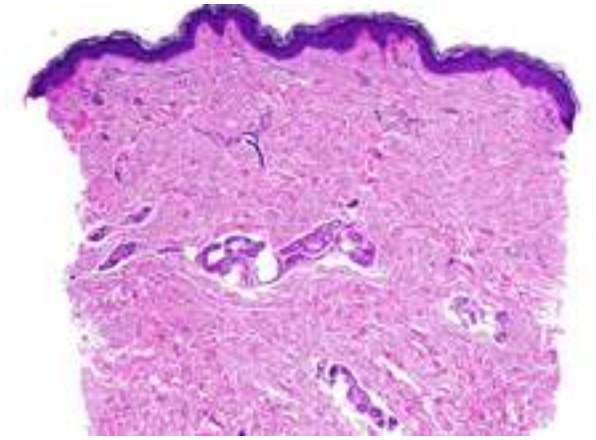

Figure 3. Focal elongation of epidermis and melanin overload of interpapillary ridges reaching follicular infundibulum tumors.

Clinically, it usually appears within the first and second decade of life.[4] Lesions appear as slightly depressed lentiginous and hyperpigmented macules with reticular arrangement, located on the dorsal side of the hands and feet. Over time, they may extend proximally as they become hyperpigmented, proportionally to the time of evolution and sun exposure.[3] These increase in number and spread centripetally with age. A diagnostic feature worth emphasizing is the presence of small pits causing a break in the patterns of the epidermal ridges on palms and, less commonly, on the dorsum of fingers.[7] Eventually, the extensor surface of the limbs, neck, upper trunk, face, and eyelids are affected. Rarely, they can affect the flexures, the palms of the hands and the soles of the feet. Disseminated hypo or achromic papules and macules have frequently been described.[3,4]

The ADAM10 protein is part of the ADAM family (a disintegrin and metalloprotease).[8] This family of transmembrane proteins plays a role in a variety of biological processes, such as cell adhesion, migration, proteolysis, and signalling.[5] Adam10 haploinsufficiency causes freckle-like macules in hairless mice.[8] In 2013, Kono[9] identified ADAM10 mutations in five Japanese families through whole exome sequencing. Based on these discoveries, it can be related to mutations in the ADAM10 gene as a probable cause of RAK.

There are in vitro studies where it was shown that the transmembrane glycoprotein PMEL17, (GP100),[10] undergoes proteolysis, giving rise to fibrillar proteins that form the cellular matrix, the site of melanin deposition in melanosomes, process regulated by ADAM.[4] Based on the aforementioned, its function is more related to the distribution and transport of melanosomes to keratinocytes than to the formation of melanosomes.[10]

Dermatoscopy reveals pigmentation showing a fine network of nonspecific reticular brown pigment and palmoplantar depressions, as well as brown dots.[7] Histologically, it shows epidermal atrophy, elongation and increased melanin in the interpapillary ridges, with scant perivascular lymphocytic infiltrate and an increased number of DOPA-positive basal melanocytes.[11] Light microscopy studies describe mild hyperkeratosis without parakeratosis, along with elongation of the interpapillary ridges, increased number of melanocytes and pigmentation in the lower epidermis without evident incontinentia pigmenti in the dermis.[11]

No successful therapy for reticulate acropigmentation of Kitamura has been reported. In 1992, Kameyama[12] described the use of 20% azelaic acid twice a day for several weeks, observing significant depigmentation with no adverse effects, histologically demonstrating an increase in the number of dopa-positive melanocytes.

In 1996, Jung Lee[13] described the use of Q-switched Alexandrite laser for two to three sessions on intervals of 2 to 3 weeks, observing recurrence at the end of treatment. However, Fahad[14] in 2011 described the use of 75nm Q-switched Alexandrite laser with two sessions (6 weeks apart), resulting in 50% success after 2 years of follow-up.

In 2014, Hyung Lee[15] described the use of Q-switched Nd laser: YAG for 7 sessions during 2 years, with a 10-year follow-up. Repigmentation was not observed in the treated areas.

CONCLUSION

The interest of this clinical case lies in the infrequent presentation of this genodermatosis. Despite the fact that most cases are reported in Japan, this condition if of worldwide distribution. However, prevalence of the disease cannot be determined due to its rarity. The clinical presentation varies between the first and second decade of life, characterized by hyper- and hypopigmented patches with reticulate appearance. In some cases, it can occur in conjunction with other genodermatoses. Fortunately, it is an entity with a benign and asymptomatic course, which sometimes can even be underdiagnosed. Characteristically, RAK is the only condition that presents palmar dimples and atrophy of pigmented lesions. It is usually barely perceptible. Con-

sequently, pertinent research must be exhaustive, and certain implements, such as ink can be used to make it more evident and facilitate detection.

Much remains to be discovered regarding this pathology. Some therapeutic options can improve clinical appearance, as well as the quality of life of patients.

REFERENCES

1. Sardana K, Goel K, Chugh S. Reticulate pigmentary disorders. Indian journal of dermatology, venereology and leprology. 2013;: p. 79(1), 17–29.
2. Zhang J, Li M, Yao Z. Updated review of genetic reticulate pigmentary disorders. The British journal of dermatology. 2017;: p. 177(4), 945–959.
3. Santos Anaya R, Beltrán Grados G, Meza Méndez B, Martínez Raygada S*. PRESENTACIÓN INUSUAL DE UN CASO DE ACROPIGMENTACIÓN RETICULADA DE KITAMURA. DERMATOLOGÍA PERUANA. 2013;: p. VOL 13, Nº 3, 231-233.
4. Olguín-García M, Palacios-Reyes M, González-González M. Acropigmentación reticulada de Kitamura. Revista Centro Dermatológico Pascua. 2020;: p. 29 (1): 10-15.
5. Edwards DR, Handsley MM, Pennington CJ. The ADAM metalloproteinases. Molecular Aspects of Medicine. 2008;: p. 29, 258–289.
6. Kocatürk E, Kavala M, Zindanci I, Zemheri E, Koç MK, Sarigül S. Reticulate acropigmentation of Kitamura: Report of a familial case. Dermatology Online Journal. 2008;: p. 14(8).
7. Koguchi H, Ujiie H, Aoyagi S, Osawa R, Shimizu H. Characteristic findings of handprint and dermoscopy in reticulate acropigmentation of Kitamura. Clinical and experimental dermatology. 2014;: p. 39(1), 85–87.
8. Tharmarajah G, Faas L, Reiss K, Saftig P, Young A, Van Raamsdonk CD. Adam10 haploinsufficiency causes freckle-like macules in Hairless mice. Pigment Cell Melanoma Res. 2012;: p. 25, 555–565.
9. Kono M,SK,SM,HM, Takama H, Suzuki T, Matsunaga K, Tomita Y, Akiyama M. Whole-exome sequencing identifies ADAM10 mutations as a cause of reticulate acropigmentation of Kitamura, a clinical entity distinct from Dowling-Degos disease. Human molecular genetics. 2013;: p. 22(17), 3524–3533.
10. Kawaguchi M, Hozumi Y, Suzuki T. ADAM protease inhibitors reduce melanogenesis by regulating PMEL17 processing in human melanocytes. Journal of dermatological science. 2015;: p. 78(2), 133–142.
11. Okamura K, Abe Y, Araki Y, Hozumi Y, Kawaguchi M, Suzuki T. Behavior of melanocytes and keratinocytes in reticulate acropigmentation of Kitamura. Pigment cell & melanoma research. 2016;: p. 29(2), 243–246.
12. Kameyama K, Morita M, Sugaya K, Nishiyama S, Hearing VJ. Treatment of reticulate acropigmentation of Kitamura with azelaic acid: An immunohistochemical and electron microscopic study. Journal of the American Academy of Dermatology. 1992;: p. Volume 26, Issue 5, Part 2, Pages 817-820.
13. Jung Lee H, Seong Choi G, Lee ES. Acropigmentation Symmetrica of Dohi Treated with the Q switched Alexandrite Laser. Annals of Dermatology. 1997;: p. Vol 9, No1.
14. Fahad A, Al Shahwan H, Bin Dayel S. Treatment of reticulated acropigmentation of Kitamura with Q-switched alexandrite laser. International journal of dermatology. 2011;: p. Sep;50(9):1150-2.
15. Hyung Lee J, Hee Lee J, Heung Lee J. A Case of Reticulate Acropigmentation of Kitamura. Annals of Dermatology. 2014;: p. 26 (6), 783.