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Frictional melanosis: Clinical picture and its main physical, morphological, organic, histopathological and psychological manifestations

Abstract

Introduction: Melanosis due to friction or rubbing is a skin disease caused by mechanical irritation in specific areas of the skin, characterized mainly by a diffuse and mottled darkening observable in the epidermis.

Objective: This article analyzes the clinical picture and the main physical, morphological, organic, histopathological and psychological manifestations of frictional melanosis.

Methodology: This is a documentary review with a non-experimental design, which raises the main clinical manifestations of friction melanosis, in order to differentiate it from other pathologies that also correspond to skin pigmentations.

Result: The analysis indicates that there are several types of clinical manifestations for this pathology classified within the melanosis, namely, morphological, physical, organic, histopathological, and psychological manifestations.

Conclusions: In conclusion, the importance of knowing the clinical picture and the manifestations of friction melanosis is highlighted in order to differentiate it from other similar pathologies, such as: cantosis nigricans, cutaneous amyloidosis, andcontact dermatitis; very similar diseases in terms of physical and morphological manifestations, but differ in origin and organic and histopathological manifestations; therefore, different treatments must be administered. Thus, having a specific understanding of the clinical picture and the different manifestations of frictional melanosis contributes to issuing aaccurate diagnosis and, therefore, administer the most appropriate treatment.

Keywords: clinical picture, clinical manifestations, melanosis due to friction, melanoderma, skin pigmentation

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Introduction

Over the years, various types of pathologies associated with skin pigmentation have been discovered; some of which have great similarities to the point that it is difficult to establish their differences. In order to make a specific diagnosis of the disease, the application of an anatomoclinical procedure is necessary, and sometimes, supported by exhaustive complementary tests. Initially, it must be known if the pigmentation has been the consequence of an excess of melanin, a cutaneous deposit of iron, carotenoids or a substance that is not normally found in the skin. It is also necessary to know if the hyperpigmentation is due to a genetic, acquired, or organic process, as stated by.[1]

Of all pigmentary pathologies, one of the most difficult to diagnose and differentiate from others is friction melanosis. The first documented cases of the disease were described by Hidano et al between 1977 and 1987, but without recognizing the disease as such. In 1983, Asai et al described 13 specific cases of melanosis in skin areas located on the bones. Then, in 1983 and 1985 Tanigaki, et al, presented 3 cases with a quite unusual dark brown pigmentation, which was distributed in protruding bone areas, reporting, by patients, the use of brushes and nylon towels during bathroom; These cases were the reference to give a name to the condition: friction dermatosis. It should be noted that, in 1984, Hidano et al instituted the name of melanosis due to friction, as it is currently known.[2-4]

In the American area, there are very few cases that refer to this pathology; being the Japanese authors who focus the greatest research efforts regarding the etiology of the disease and its histological manifestations. In 1985, a case of friction melanosis was documented for the first time in the Mexican literature, presented at the XII Mexican Congress of Dermatology, and later, in 1986, Magaña described eight patients with this type of friction dermatitis; but it is not until 1989 that he decides to publish it in an international academic journal, for public knowledge and dissemination.[2]

Since 1986, more cases of the pathology have been recognized; for example, Pintos et al.,[5] speak of the existence of 3 cases of melanosis due to friction, on the other hand, Amador et al.,[3] mention 17 more cases, of which 6 deposits were found. amyloid in the dermis, presuming the possibility that such a dermatosis corresponds to an initial study of another similar disease, both clinically and histologically, namely, cutaneous amyloidosis.[2,3,5] In correspondence with this, González et al.,[1] mention that frictional melanosis is also associated with some types of amyloidosis, in which environmental, genetic, and mechanical factors are involved.

More recently, studies are known that speak of the great similarities between acanthosis nigricans and friction melanosis, in terms of their physical and morphological manifestations. However, said acanthosis is usually related to certain endocrinological disorders, such as insulin resistance, diabetes mellitus and obesity, as well as polycystic ovary syndrome. In addition, an unusual variant of malignant acanthosis nigricans related to gastric adenocarcinoma has also been described.[6,7]

All these historical approaches about friction melanosis show the time it has taken to investigate about it and the scarce information that

is perceived to date, as well as the confusion that the symptoms and physical manifestations continue to generate, even in dermatology professionals. The study is of great theoretical importance since it allows to have clearly defined the differences between the different types of melanosis that can occur on the skin of the human being. In addition, in practice, research is relevant because it allows an adequate diagnosis of the pathology to be made in order to administer the ideal treatment to treat it. Finally, from the methodological point of view, it sets a precedent for future research in the area of study.

Considering the above, this article aims to analyze the clinical picture of friction melanosis and its main physical, morphological, organic, histopathological and psychological manifestations; in order to know how to identify the presence of a friction melanosis in patients, without confusing it with other very similar pathologies that present similar clinical pictures and manifestations, especially in terms of location of pigmentation and appearance; like, heaacantosis nigricans, cutaneous amyloidosis and contact dermatitis.

Methodology

This article is a documentary review with a non-experimental design, which presents the main clinical manifestations of friction melanosis, in order to differentiate it from other pathologies that also correspond to similar skin pigmentations. The study begins with the definition and description of the melanosis pathology due to friction, from different perceptions and theoretical postulates; then, it presents a detail of the different physical, morphological, organic, histopathological and psychological manifestations; and, finally, a contrast between what was observed and what was exposed by different authors who talk about the clinical manifestations of melanosis due to friction.

Bibliographic sources such as digital books, scientific articles published in indexed academic journals and special degree works were used; taken from repositories, indexes and databases found on the web, using the following entries: melanosis, melanosis due to friction, hyperpigmentation, melanoderma, clinical manifestations of melanosis and clinical picture of melanosis. All of which contributed to the construction of theories about melanosis due to friction, to identify the beginnings of the disease and its first documentation, as well as to know the different clinical manifestations of the disease that have been appearing and being accepted throughout.

Theoretical aspects of friction melanosis

The Royal Dictionary Spanish Academy,[8] mentions that melanosis is a word of Greek origin that communicates the idea of blackening. It represents an alteration of organic tissues, whose main characteristic is the dark color reflected in the skin. In this same sense, Rivera[9] explains that the melanosis is a group of disorders differentiated by hyperpigmentation of the skin due to the overproduction of melanin from a normal number of melanocytes or an increase in their number. Therefore, melanosis is a lesion that shows alarge numbers of normal melanocytes that are imprisoned in the basal layer of the squamous epithelium, in which the pigment melanin is confined.[10,11]

Bearing this in mind, frictional melanosis is a dermatosis, apparently caused by acute and constant friction of the skin, which, depending on the type of skin, gives rise to hyperchromic spots that normally appear in places where solid tissues are found underlying. It is possible that it is an external factor that contributes to its appearance, being repeated friction with certain materials such as a sponge, towel or brush made of nylon or plant fiber materials, which damages the basal layer of the skin, altering the pigment and possibly amyloid deposition.[12]

Likewise, Cubero et al.,[13] argue that friction melanosis is a pathology that demarcates an asymptomatic hyperpigmentation, poorly defined, diffuse, with a smooth surface, and without the presence of secondary lesions, which usually appears in places that have a bone base, such as in scapular and clavicular regions. This disease predominates in people with high phototypes of skin, especially in brown skin; and is characterized by making people appear reticular dark pigmentations, caused by repeated mechanical irritations in bony projections, such as dorsal, vertebral and clavicular areas.

So, within the pathogenesis of melanosis due to friction, the skin phototype is found, since dark skin with phototype III to VI is much more likely to acquire hyperpigmentation than those classified as phototype I and II; These dark skins respond more quickly to the presence of dermatoses and lesions that alter the pigmentation of the skin, with high possibilities of darkening and blackening of the same, giving rise to spots.[12,13]

The color of the stain that generates the hyperpigmentary lesion is very important, sinceindicates where the melanin is located in each patient; for example, when the lesion has a brown color, it is because there was an increase in melanin in the epidermis, caused by a greater production of melanosomes, and more transfer to the keratinocytes; but, if the lesions are gray-blue, it is because the melanin has been deposited in the dermis, possibly due to the existence of melanocytes or histiocytes that absorb melanin.[14]

The causes of melanosis due to friction are very diverse, but its main cause ismechanical irritation causing mottled blackening of the skin (Skinderma, 2016). It is necessary to mention that the etiology of disorders that give rise to increases in skin pigmentation can have two types of origin: congenital or acquired. Regarding the acquired ones, they are produced by an increase in melanin, an excess of melanogenic pigment, an increase in the number of melanocytes, or by secondary inflammatory processes.[1]

Frictional melanosis can also be caused by the prolonged application of topical corticosteroids, and by physical aggressions to the skin caused by continuous scratching in the same area, accidental burns, or trauma. Additionally, it is worth adding that the etiology of melanosis due to friction is traumatic, caused by injuries such as rubbing, rubbing, scratching, burns, shaving, skin contact with hard surfaces, among others.[9,15-17]

Another cause of melanosis is natural friction, which occurs when the skin over the bone region is located between an active friction force and a rigid surface, in short, the skin rests on inflexible places that are not moving, such as in bony areas. This permanent friction produces the pathology melanosis due to friction. According to Onuma,[12] an important etiological factor of this type of hyperpigmentation is that it normally occurs in protruding bone areas; place where the friction is much more intense, even if it is natural.

In what regarding the diagnosis of melanosis due to friction, it often turns out to be difficult and complicated because it is based on the etiology or origin of the disease. Its diagnosis depends a lot on the clinical history of the patient, since it is necessary to know the pathological history of the patient and to have information regarding the administered treatments. Likewise, knowledge about the patient's traumatic history is also important, such as: friction, wounds, burns, sun exposure, handling of chemical substances, among others.[15,16,18]

With the foregoing, the premise that the etiology of melanosis due to friction is very diverse is ratified; As it is a type of acquired hyperpigmentation, it occurs when there is an increase in melanin,

an excess of melanogenic pigment, an increase in the number of melanocytes, or due to acquired secondary inflammatory processes. It can also be caused by prolonged application of topical corticosteroids, physical aggression to the skin, burns or trauma. Another cause is natural friction, when the skin over the bone region is located between an active friction force and a rigid surface; Although the most common is that it is acquired by common mechanical actions such as: friction, wounds, burns, exposure to the sun, handling of chemical substances, shaving, contact with hard surfaces, among others.

Clinical manifestations of friction melanosis

Cubero et al.,[13] explains that friction melanosis is asymptomatic and its main manifestation is hyperchromic, poorly defined, irregulars spots with a smooth surface; without the presence of secondary lesions. The spots are usually gray, pale brown, or dark brown in color and usually appear in bone-based areas such as the scapular and clavicular. An important characteristic of friction melanosis stains is that they are of different sizes, but they can grow and darken as long as mechanical friction is present, and depending on their origin, as well as the intensity and duration of the friction.

Although it seems that physical stains are the only manifestation of melanosis due to friction, it is important to indicate that this is not the case, since the pathology also presents organic, histological, and psychological manifestations, among others, that are very diverse and often go unnoticed, but they can be detected through consultations, medical studies and clinical examinations carried out on the patient. Table 1 presented below describes the types of manifestations, their details and clinical characteristics, in order to know the clinical picture of friction melanosis and not confuse it with other pathologies that produce pigmentation in the skin.

Table 1 Clinical picture and manifestations of melanosis due to friction

Manifestations	Specs	Clinical features
Physical and morphological Manifestations	Patterns/Signs	In waves: Maculeshyperchromic in the clavicular region and supraclavicular fossa
		On postage stamps: Linear hyperchromic macules like the vertebrae in the scapular region
		On zebra spots: Hyperchromic macules in the costal area.
		In pigmented sea: Hyperchromic brown to black macules with a reticular appearance.
		In archipelago: Macules that do not affect the areasperifollicular.
	Morphology	Hyperchromic, irregular, well-circumscribed, poorly defined, smooth-surfaced spots
	Appearance	Reticular, banded, or diffuse appearance
	Size	Undefined size, various
	Color	Pale or dark brown, blackish brown, or slate gray
	Zone	Areas where there are underlying solid tissues.
		Protruding bony areas such as the clavicular area, the thyroid cartilage area in the neck, the upper part of the posterior region of the trunk, the costal region, the vertebral region, the presternal region, the scapular region, and the region of the supraclavicular fossa.
		Zonas nigris areas, such as neck, arms, back, thighs, crotch and armpits.
		It generally spares the perifollicular regions.
	Duration	Its appearance is transitory or permanent
		It can last weeks, months, even years
Internal organic Manifestations		Persistent damage to the dermis.
		Creation of inflamed pustules.
		Blood vessels located in the skin burst
		Production of excess melanogenic pigment
		Sebum and keratin layer removal
		Coagulation between the interstitial spaces of the cells
		Skin oxidation
Histopathological Manifestations		Normal epidermis
		Thickened stratum corneum
		Basal layer pigmentation
		Transepidermal pigment removal
		Melanin pigment free or engulfed in macrophages, in the superficial dermis
		Amyloid deposition in the papillary dermis
Psychological Manifestations		Low self-esteem
		Low self-confidence
		Shame
		Tendency to isolation
		Decrease in social gatherings

Table Continued....

Manifestations	Specs	Clinical features
Other Manifestations	Frequent Manifestations	Dry skin
		Redness of the affected area
		Blackening of the affected área
	Uncommon manifestations	Irritations
		Thickening
		Itch
		Burning
		Peeling
		Infections
		Red and swollen pimples

Source: Own elaboration, based on De La Hoz[19], Magaña et al[2], Amador et al[3], Rivera[9], Onuma[12], Nazareth Hospital[20]

Discussion

The diagnosis of melanosis due to friction will depend on the history of the use of materials to rub the skin during the bath, as well as other types of friction: between skins, between skin and clothing, or between skin and hard surfaces, causing mechanical irritations, as described by Skinderma[21]. Said dermatosis tends to appear in protruding bone areas, where friction is more intense; In addition, it originates froman external factor that, according to Onuma[12] is the intense and constant friction of the skin with materials such as a towel, sponge or nylon brush or plant fiber materials; causing damage to the basal layer of the skin, pigment alterations and probably amyloid deposition; leading tomelanoderma or acquired hyperpigmentation.

The pathology most frequently affects areas where there are underlying solid tissues, or bony protruding areas such as the clavicular area, the thyroid cartilage area in the neck, the upper part of the posterior region of the trunk, the vertebral region, the costal region, the presternal region, the scapular region and the supraclavicular fossa region; the most frequent being the neck, clavicular and posterior aspect of the trunk. Morphologically, it is characterized by irregular, hyperchromic spots of different sizes, well circumscribed, dark brown, blackish brown or slate gray; with a reticular, banded or diffuse appearance, and generally respects the perifollicular regions.[2,3]

Frictional melanosis is a dermatosis with an insidious onset, with an unclear evolution time ranging from 1 to 3 months to 11 years, with an average of 2 to 5 years. The pathology is asymptomatic, however, it is sometimes accompanied by moderate or mild itching. In general, there is a history of friction exerted on the skin for a period of 6 to 15 years and there are no additional alterations in relation to associated systemic diseases, such as endocrinological diseases (present in acanthosis nigricans); ruling out, furthermore, that it is a form of contact dermatitis generally caused by allergies to certain natural or chemical substances. On the other hand, the results of laboratory tests, epicutaneous or photopatch tests are normal.[2,3]

Regarding the histopathological manifestations, the main and common findings are a thinned epidermis or with minimal atrophy, and acanthosis or normal epidermis; increased amount of pigment in the basal layer; sometimes, areas of alteration of said layer, giving rise to incontinence of pigment with free melanin in the dermis and within the macrophages; as well as discrete perivascular infiltration and normal adnexa.[12] Regarding the presence of amyloid, some cases mentioned by Hidano, et al, in 1984, reported amyloid deposition in the papillary dermis, giving the possibility that this was secondary to epidermal damage, something similar to the theory of cutaneous amyloidogenesis in which it is presumed that keratinocyte damage gives way to amyloid production.[2]

Similarly, six of the seventeen cases reported by Amador et al.,[3] showed the minimal presence of amyloid deposition, with no difference being found in the clinical pattern of these specific cases with respect to the rest of the patients studied. study. What had been postulated theoretically was that the damage to the basal layer gives rise to degeneration of the epidermal cells, with the formation of amyloid, or also that these cells serve as a matrix for its subsequent deposition; this alteration can explain others, such as pigment incontinence and keratinocyte alterations. On the other hand, studies on cutaneous amyloidosis have determined that this amyloid is derived from epidermal keratinocytes and that its composition has certain amino acids that differentiate it from systemic amyloid.[22-25]

The presence of amyloid in some cases of friction melanosis has raised the possibility that both diseases are associated, or that friction melanosis is even a stage prior to cutaneous amyloidosis.[2,3] In support of this hypothesis, Chu Kwan, et al in 1988 described two cases of amyloidosis with a history of friction with a nylon towel during bathing, which they called friction amyloidosis. Likewise, in 1986, Mizuguchi and his collaborators described six cases of cutaneous amyloidosis with pigmentations very similar to that of melanosis due to friction.[26]

Along the same lines, Hashimoto et al.,[27] describe two cases of macular amyloidosis on the back with a history of prolonged friction during bathing, but in this case with a nylon brush. Likewise, in more recent years, Ywasaki et al.,[28] reported the case of a patient diagnosed with melanosis due to friction with subsequent development of papular lesions, whose histopathological study revealed the presence of two simultaneous pathologies, namely, melanosis due to friction. skin friction and amyloidosis.

Lastly, it is importantIt should be noted that melanosis due to friction is often confused with acanthosis nigricans, a hyperpigmentation with a similar appearance, but whose etiology is different, sinceit is normally associated with endocrinological disorders, such as insulin resistance, type 2 diabetes mellitus and obesity, as well as polycystic ovary syndrome; and, in more extreme cases, with gastric adenocarcinoma.[6,7] Secondly, according to Gonzalez et al.,[1] friction melanosis is also associated with amyloidosis, a more complex pathology involving genetic, environmental and skin friction factors, but more chronic. Therefore, due to the existence of this tIn the type of pathologies such as acanthosis and amyloidosis, it is advisable to first know the basic causes of hyperpigmentation before making a diagnosis, in order not to confuse them with melanosis due to friction.

Conclusion

Frictional melanosis is a medical pathology in the area of dermatology, classified within the melanoderma of acquired hyperpigmentation. Presents an overproduction of melanin in the skin, from a normal number of melanocytes or their increase. Usuallytheit causes an external factor, such as intense and constant skin friction, causing damage to the basal layer of the skin, altering the pigment and probably producing amyloid deposits; what causes stains hyperchromic, poorly demarcated, irregular, and smooth-surfaced lesions that are usually gray, pale brown, or dark brown in color, and generally appear in bone-based areas such as the scapular and clavicular.

The etiology of friction melanosis is very diverse; It occurs when there is an increase in melanin, an excess of melanogenic pigment, an increase in the number of melanocytes, or due to acquired secondary inflammatory processes. It can also be caused by prolonged application of topical corticosteroids, physical aggression to the skin, burns or trauma. Another cause is natural friction, when the skin over the bone region is located between an active friction force and a rigid surface; Although the most common is that it is acquired by common mechanical actions such as: friction, wounds, burns, exposure to the sun, handling of chemical substances, shaving, contact with hard surfaces, among others.

Although it seems that physical stains are the only manifestation of melanosis due to friction, it is important to indicate that this is not the case, since the pathology also presents very diverse organic, histological, and psychological manifestations, among others. Therefore, it is important to know and identify them in order to differentiate friction melanosis from other pathologies similar in terms of physical and morphological manifestations but that differ greatly from the histopathological and organic point of view. Therefore, knowing in detail the clinical manifestations of frictional melanosis contributes to a good diagnosis andtreatment to the patient.

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Conflicts of interest

Author declares there is no conflict of interest.

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