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Majocchi Granuloma: A Comprehensive Review of a Rare but Significant Clinical Entity

Alma Yaneli Alvarez Romero[1], Lorena Estefani Alfaro García[2], María Erika Boza Medrano[3], Monserrat Espinosa Ramos[4], Susana González Hernández[5],Manuel Alejandro Coello Manuell[6]

[1]Hospital General Regional 1 Tijuana Instituto Mexicano del Seguro Social.

[2]Hospital General de Zona #2 Dr. Efrén Correa Magallanes, Instituto Mexicano del Seguro Social.

[3]Hospital general de zona #1 Durango. Instituto Mexicano del Seguro Social. Durango, México

[4]Hospital Dr. Jesús Gilberto Gómez Maza, Tuxtla Gutiérrez, México.

[5]Hospital General Dr. Dario Fernandez Fierro. Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado. Ciudad de México, México.

[6]Facultad de Medicina. Universidad Nacional Autónoma de México.

ABSTRACT

Majocchi granuloma is an uncommon but relevant clinical entity involving deep infection of hair follicles and dermal layers by dermatophytes. Although its exact incidence and prevalence are not well established due to its rarity, it has been observed predominantly in young adults of both sexes. The clinical presentation of Majocchi granuloma is characterized by the presence of nodules, papules or pustules in areas of increased hair density, which can be painful, pruritic and even ulcerate. Accurate diagnosis can be challenging due to its clinical similarity to other skin conditions, requiring a thorough evaluation including clinical history, physical examination and sometimes complementary tests such as microscopic examination, culture of skin samples and biopsy.

Treatment of Majocchi granuloma is based on the administration of antifungal therapy, either topical or systemic, to eliminate the infection and control the inflammatory response. Topical antifungals are usually appropriate for localized skin lesions, while systemic antifungals are reserved for more extensive or resistant cases. In addition, additional measures such as symptom relief and prevention of complications are important. Despite the lack of epidemiologic and clinical studies, increased awareness and understanding of Majocchi granuloma is required to facilitate its early diagnosis and optimal management. Future research is needed to improve diagnostic and therapeutic approaches, and emphasizes the importance of a multidisciplinary approach to adequately address this condition and provide appropriate care for affected patients.

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INTRODUCTION

Majocchi granuloma, also known as trichophytic granuloma profunda, is an inflammatory, granulomatous skin disease that primarily affects immunocompetent individuals. It is characterized by deep invasion of dermatophyte fungi into hair follicles and adjacent tissues, resulting in granuloma formation and an intense inflammatory response.1

This condition typically occurs in hairy areas, such as the legs, arms and groin area, and is usually caused by dermatophytes of the genus Trichophyton, such as Trichophyton rubrum and Trichophyton interdigitale. Majocchi granuloma can occur as a result of direct inoculation of the fungus through skin trauma, such as scratches, wounds or abrasions, or as a complication of previous superficial fungal infection, such as tinea corporis.1,2

The pathophysiology of Majocchi granuloma involves a series of complex events that are triggered by the interaction between dermatophytes and the host. Initially, colonization of the skin by dermatophytes, mainly of the genus Trichophyton, occurs. This colonization is facilitated by fungal penetration through previous skin trauma, such as abrasions, cuts or wounds.3,4

Once dermatophytes have entered the deeper dermal layers and hair follicles, they begin their parasitic life cycle. Dermatophytes possess keratinolytic enzymes, which allow

them to obtain nutrients from the keratin present in the skin and hairs. In addition, these fungi are able to evade host defenses by producing proteolytic enzymes and modulating the local immune response.5,6

Fungal colonization triggers an inflammatory response in the skin, involving the release of proinflammatory cytokines and the recruitment of inflammatory cells. Aggregates of inflammatory cells, such as neutrophils, lymphocytes and multinucleated giant cells, form in the affected dermal tissue. These cells produce inflammatory mediators that contribute to the formation of granulomas, structures characterized by a focal accumulation of inflammatory cells and fibrous tissue.7

The inflammatory process and granuloma formation can lead to various clinical manifestations in Majocchi granuloma. Typical lesions include nodules, papules or pustules on the skin, which may be painful and pruritic. These lesions may be located in areas with higher hair density, due to the greater ease of colonization by dermatophytes.8

The pathophysiology of Majocchi granuloma is based on colonization of the skin by dermatophytes, which triggers an inflammatory response and granuloma formation. Dermatophytes use keratinolytic enzymes to obtain nutrients from the skin and evade host defenses by producing proteolytic enzymes and modulating the local immune response. Granuloma formation can cause the appearance of characteristic skin lesions such as nodules and papules.9

Majocchi granuloma is a rare cutaneous condition and is infectious in nature, affecting a limited proportion of the population. The exact incidence and prevalence of Majocchi granuloma are not well established due to its rarity and the lack of comprehensive epidemiological studies.10

EPIDEMIOLOGY

This condition has been observed most frequently in immunocompetent individuals, i.e. those with a normal immune system. However, it has also been reported in individuals with compromised immune systems, such as those receiving immunosuppressants, having HIV/AIDS infection, or undergoing cancer treatment. The infection appears to affect both sexes equally and can manifest in all ages, although it has been observed more frequently in young adults.11

Transmission of Majocchi granuloma usually occurs through direct contact with sources of infecting dermatophytes. These fungi are commonly found in the environment, such as soil, animals, contaminated objects, and even other infected persons. Infection usually occurs by entry of dermatophytes through previous skin trauma, such as cuts, wounds or abrasions. In addition, factors such as humidity and poor personal hygiene can increase the risk of acquiring the infection.11

Majocchi granuloma occurs most frequently in geographic areas with warm, humid climates, which provide optimal conditions for dermatophyte growth. However, cases have been reported in various regions of the world, suggesting that the geographic distribution of the disease is not restricted to a specific area.12

Because Majocchi granuloma is a rare and underdiagnosed condition, it is possible that its actual incidence is higher than currently reported. In addition, due to the lack of specific epidemiological studies, the available information on the epidemiology of this disease is limited and based on case reports and case series.13

CLINIC

Majocchi granuloma presents clinically as a cutaneous condition characterized by a series of clinical manifestations that primarily affect the deeper dermal layers and hair follicles. These manifestations can vary in appearance and severity, and their clinical presentation is often nonspecific, which can make diagnosis difficult.14

The typical skin lesions of Majocchi granuloma present as nodules, papules or pustules on the skin. These lesions can vary in size from small papules to larger nodules and may be scattered or clustered in specific areas. The most common location of the lesions is in areas with higher hair density, such as the scalp, groin, armpits and legs.15

The lesions can be painful and pruritic, which can cause significant discomfort in affected patients. In addition, in some cases, the lesions may ulcerate and have purulent discharge. These complications may be associated with an increased risk of secondary infections and delay healing of the lesions.16

It is important to note that Majocchi granuloma can mimic other skin conditions, which can make clinical diagnosis difficult. The clinical presentation may be confused with other superficial fungal infections or even with inflammatory skin diseases such as pyoderma or folliculitis. Therefore, a detailed medical evaluation is required, including careful observation of the lesions, clinical history and, in some cases, complementary tests to confirm the diagnosis.16

DIAGNOSIS

The diagnosis of Majocchi granuloma is based on a thorough clinical evaluation, involving observation of the skin lesions, as well as the use of specific complementary tests. Since the clinical manifestations may mimic other skin conditions, the differential diagnosis should be considered to rule out other similar diseases.17

The clinical evaluation begins with a detailed medical history, including questions about the symptoms present, their duration, and the progression of the lesions. Any history of previous skin lesions, trauma or contact with potential sources of dermatophytes is also investigated.18

During the physical examination, a careful inspection of the skin lesions present on the patient is performed. The characteristics of the lesions, such as their appearance, size, distribution, and presence of pain or pruritus, can provide important diagnostic clues. Typical lesions of Majocchi

granuloma include nodules, papules or pustules in areas of increased pilosebaceous density.18

In addition to clinical evaluation, additional tests may be used to confirm the diagnosis of Majocchi granuloma. These tests include microscopic examination and culture of samples of affected skin. During microscopic examination, a sample of the skin lesion is taken and viewed under a microscope to detect the presence of fungal hyphae and other structures characteristic of dermatophytes.19

Culture of skin samples is another important test for diagnosis. A sample is taken from the lesion and placed on specific culture media to allow dermatophytes to grow. Identification of the species of fungus involved is done by microbiological techniques and can provide additional information on etiology and sensitivity to antifungals.20

In some cases, a biopsy of the skin lesion may be performed to obtain tissue samples for microscopic examination. The biopsy may reveal the presence of granulomas and inflammatory cell infiltration, supporting the diagnosis of Majocchi granuloma.21

TREATMENT

Treatment of Majocchi granuloma is based on the administration of specific antifungal therapy aimed at eradicating the dermatophyte infection and controlling the associated inflammatory response. The choice of treatment depends on several factors, such as the extent of the lesions, the severity of the symptoms and the immunological condition of the patient.22

In most cases, topical antifungal therapy is recommended as the first line of treatment for localized skin lesions. Commonly used topical agents include antifungal creams or ointments containing imidazole or triazole derivatives. 23

These drugs act by inhibiting the synthesis of ergosterol, an essential component of the fungal cell wall, resulting in the death and elimination of dermatophytes. Topical application is performed regularly on affected lesions, following the specific directions of the prescribed drug.24

In more extensive cases or cases resistant to topical treatment, systemic therapy with antifungals may be considered. Systemic antifungals, such as oral azoles (e.g. itraconazole or fluconazole), are used to fight the infection from inside the body. These drugs have a broader and more penetrating action, allowing them to reach the deeper layers of the skin and hair follicles, where dermatophytes are often present. The dosage and duration of systemic treatment vary according to individual patient characteristics and the severity of the disease.25

It is important to note that, in addition to antifungal treatment, additional measures may be used to alleviate symptoms and prevent complications. This may include the use of creams or lotions with anti-inflammatory properties to reduce redness, pain and itching. In addition, it is recommended to maintain good personal hygiene and avoid excessive scratching of lesions to prevent the spread of infection and the risk of secondary infections.25

In cases of Majocchi granuloma associated with immunosuppression or underlying disease, it is critical to address and treat the underlying condition to improve response to antifungal therapy.25

CONCLUSION

In conclusion, Majocchi granuloma is an uncommon but significant skin condition characterized by deep infection of hair follicles and dermal layers by dermatophytes. Although its exact incidence and prevalence are not well established due to its rarity, it has been observed most frequently in young adults in both men and women.

The clinical presentation of Majocchi granuloma is manifested by the presence of nodules, papules or pustules in areas with increased hair density, which can be painful, pruritic and even ulcerate. Its clinical presentation may mimic other skin conditions, which may make differential diagnosis difficult and require careful clinical evaluation and complementary tests, such as microscopic examination, culture of skin samples and sometimes biopsy, to confirm the diagnosis.

Treatment of Majocchi granuloma is based on the administration of antifungal therapy, both topical and systemic, with the aim of eradicating the infection and controlling the inflammatory response. Topical antifungals are usually sufficient for localized skin lesions, while systemic antifungals are reserved for more extensive or resistant cases. In addition to antifungal treatment, additional measures can be used, such as symptom relief and prevention of complications through anti-inflammatory creams or lotions, good personal hygiene and avoidance of excessive scratching.

Since Majocchi granuloma is a rare and underdiagnosed disease, greater awareness and understanding of this condition is required to facilitate its early identification and appropriate management. In addition, further epidemiologic and clinical research is needed to determine additional risk factors, improve diagnostic approaches, and optimize therapeutic strategies.

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