

Follicular mucinosis: A retrospective study

Alexandra Victoria Medina Garduño¹, Mary Jose Santiago Benitez²,
María Elisa Vega Memije³, Miren Lorea Cárdenas Hernández³

¹Social Service Medical Intern, General Hospital "Dr. Manuel Gea González," Mexico City, Mexico, ²Fourth-Year Resident in Internal Medicine, Médica Sur Hospital, Mexico City, Mexico, ³Dermatologist, General Hospital "Dr. Manuel Gea González," Mexico City, Mexico

Corresponding author: Alexandra Victoria Medina Garduño, MD, E-mail: alee.medinag@gmail.com

ABSTRACT

Background: Follicular mucinosis (FM) is a rare condition characterized by the deposition of mucin in the follicular epithelium. It may be associated with benign or malignant processes (cutaneous T-cell lymphomas). Its recognition is important due to its clinical and histopathological confusion with other dermatoses. Reports in the literature are limited, most corresponding to small series or isolated cases. This study seeks to provide institutional evidence on the clinical and epidemiological presentation of follicular mucinosis in a cohort of patients treated at a referral hospital in Mexico. **Objective:** The objective was to describe the demographic and clinical characteristics of cases of follicular mucinosis treated at the Dr. Manuel Gea González General Hospital between October 1996 and June 2025. **Materials and Methods:** An observational, descriptive, retrospective, cross-sectional study was conducted using a database from the Dermatopathology Department of the Dr. Manuel Gea González General Hospital (Mexico City) for the period between October 1996 and June 2025. **Results:** Nineteen cases of patients diagnosed with follicular mucinosis were identified. Of these, 73.7% (n = 14) were female, and 26.3% (n = 5) were male. The average age of the patients was 31 years (SD: 18.64; range: 5–68 years). The median age was 31 years. The duration of clinical evolution ranged from 15 days to 10 years, with a median of 5 months. Most patients consulted after 1–2 months of evolution (31.6%), followed by 3–5 months (21.1%), while a significant group (47.4%) presented a prolonged evolution (> 6 months) before diagnosis. **Conclusion:** There was a predominance of females and earlier ages of onset than described in international series, with predominant involvement of the face and trunk.

Key words: Follicular mucinosis, Mucinous alopecia, Mycosis fungoides

INTRODUCTION

Follicular mucinosis (FM) is a rare inflammatory dermatosis characterized by the accumulation of mucin in the follicular epithelium and sebaceous glands, leading to degeneration of the outer root sheath and partial or total follicular loss [1]. Pinkus and Braun-Falco first described it in 1957 as mucinous alopecia, although it was later recognized that not all cases present with alopecia [2].

Clinically, it manifests as papules or follicular erythematous infiltrated plaques, which may resemble acneiform, urticarial, or lichenoid conditions,

depending on the depth and extent of the infiltrate. The predominant locations include the face, trunk, and extremities [3]. Its course is variable and depends on whether it is primary or secondary. The primary form is generally localized, associated with inflammatory processes, and is typically found in children and young adults, often limited to the head and neck, with a tendency toward spontaneous resolution (Fig. 1).

The secondary form occurs more frequently in adults and is associated with diseases such as systemic lupus erythematosus, insect bites, eczema, trauma, herpes virus infection, alopecia areata, hypertrophic lichen planus, radiotherapy, mycosis fungoides, Sézary

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Figure 1: Clinical images of the different morphological aspects that may occur in follicular mucinosis.

syndrome, cutaneous leukemia, cutaneous B-cell lymphoma, and Hodgkin's disease, with a more chronic course and therapeutic resistance [4,5].

Histopathology is essential to confirm the diagnosis and differentiate MF from morphologically similar conditions. Histology reveals a mixed perifollicular inflammatory infiltrate and mucin deposits in the follicular epithelium and sebaceous glands, most visible with stain (Fig. 2) [6,7]. It has been proposed that mucin results from the stimulation of follicular keratinocytes by cytokines released by perifollicular T lymphocytes, which explains the association with the possible progression to cutaneous lymphomas. Immunohistochemical studies have shown the expression of clonal T cells in many cases of primary mucinosis [3]. The clinical evolution of MF shows contrasting behaviors: primary forms tend to remit spontaneously, while secondary forms may persist or progress to cutaneous lymphomas, hence prolonged follow-up and periodic histopathological evaluation are recommended [8].

Multiple therapeutic options have been described, including the use of topical, intralesional, or systemic corticosteroids; calcineurin inhibitors; dapsone; antimalarials; isotretinoin; antibiotics such as minocycline, doxycycline, or erythromycin; non-steroidal anti-inflammatory drugs; as well as imiquimod, interferon alpha, photodynamic therapy, photopheresis,

heliotherapy, UVA-1 or NB-UVB phototherapy, pulsed laser therapy, and surgery. Therapeutic results have been variable; to date, no modality has demonstrated complete efficacy, nor has a first-line treatment been established by consensus. Likewise, cases of chronic and disseminated primary MF have been documented in the Mexican population with a persistent course and limited therapeutic response, reinforcing the clinical of this entity [9-12].

Given the scarcity of Latin American reports and the variability observed between international and local series, it is essential to document the characteristics of follicular mucinosis in different populations. Therefore, the present study aims to describe the clinical, demographic, and histopathological behavior of cases of follicular mucinosis treated at the Dr. Manuel Gea González General Hospital (1996–2025), providing evidence on its epidemiological profile in Mexico.

MATERIALS AND METHODS

An observational, descriptive, retrospective, cross-sectional study was conducted using a database from the Department of Dermatopathology at the Dr. Manuel Gea González General Hospital in Mexico City, covering the period from October 1996 to June 2025.

Non-probabilistic convenience sampling was used, based on the availability of cases in the institutional database. The inclusion criteria were patients with a histopathological diagnosis of follicular mucinosis and with complete demographic and clinical data available, including duration of evolution, topography of the lesions, morphology, and symptoms; and patients of any age and sex. Exclusion criteria were inconclusive or questionable histopathological diagnoses and incomplete clinical records. A descriptive statistical analysis was performed using Microsoft Excel 2019®, calculating the mean, median, and mode for continuous variables, and frequencies and percentages for categorical variables.

RESULTS

Nineteen patients diagnosed with follicular mucinosis were identified. Seventy-three point seven percent ($n = 14$) were women, and 26.3% ($n = 5$) were men (Fig. 3). The average age was 31 years (SD 18.64; range 5–68 years), with a median age of 31 years.

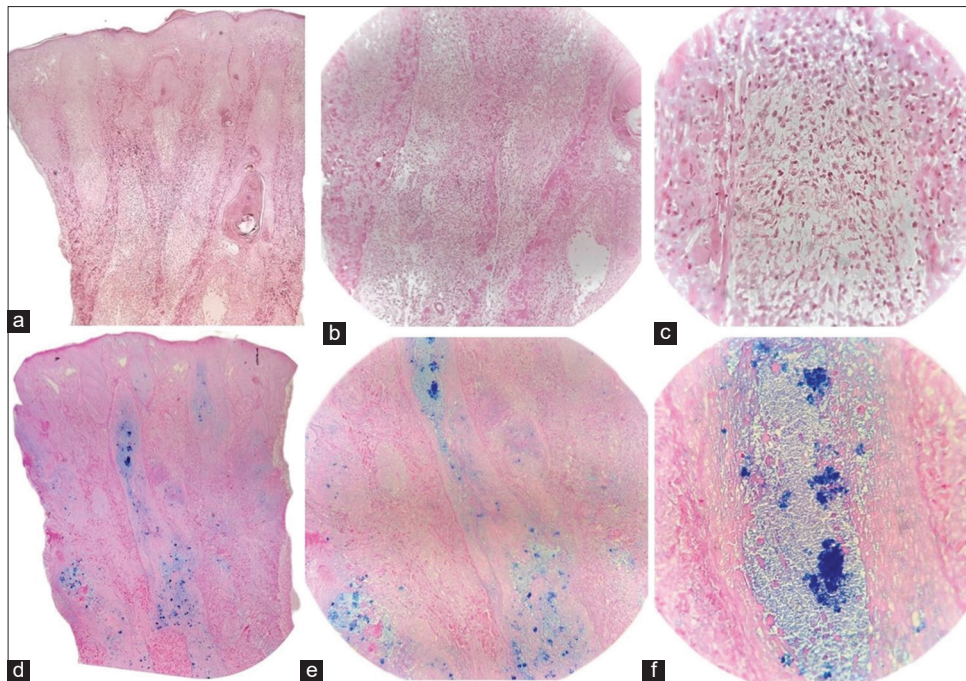


Figure 2: Histological findings of follicular mucinosis. (a-c) Histological appearance of follicular mucinosis (H&E; 10x, 40x, 60x). Hair follicles with separation of keratinocytes due to the deposited material are observed. (d-f) Alcian blue staining (10x, 40x, 60x) showing mucin deposits between keratinocytes.

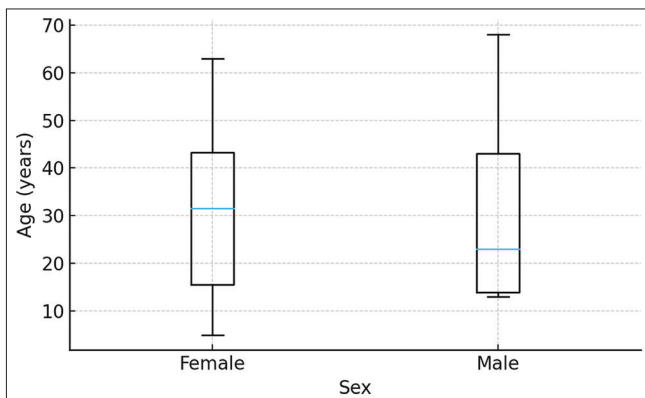


Figure 3: Age distribution according to sex.

The duration of clinical evolution ranged from 15 days to 10 years, with a median of 5 months. Most patients consulted after 1–2 months (31.6%), followed by 3–5 months (21.1%); 47.4% had a prolonged evolution (> 6 months – 10 years) before diagnosis (Table 1).

A comparison of the time of evolution according to the extent of the disease showed that disseminated cases had longer times of evolution and greater variability, while non-disseminated cases had a more recent onset and a shorter evolution (Fig. 4).

Regarding anatomical location, 55.6% presented disseminated involvement, 33.3% had lesions on the

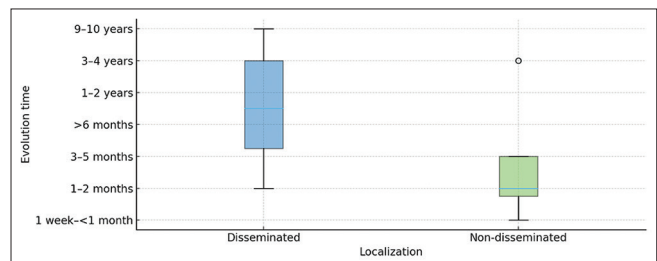


Figure 4: Comparison of disease evolution time between the disseminated and non-disseminated cases.

Table 1: Distribution of disease evolution time

Evolution Time	n (%)
< 1 month	2 (10.5%)
1–2 months	4 (21.1%)
3–5 months	4 (21.1%)
> 6 months	2 (10.5%)
1–2 years	2 (10.5%)
3–4 years	3 (15.8%)
9–10 years	2 (10.5%)
Total	19 (100%)

face or head, 5.6% on the trunk, and 5.6% in other areas (extremities or mixed locations) (Fig. 5).

Among the total number of patients, 11 (57.9%) had confirmed diagnoses, 2 (10.5%) had confirmed diagnoses with differential entities, and 3 (15.8%) were probable cases. Likewise, in five patients (26.3%), an association with mycosis fungoides was

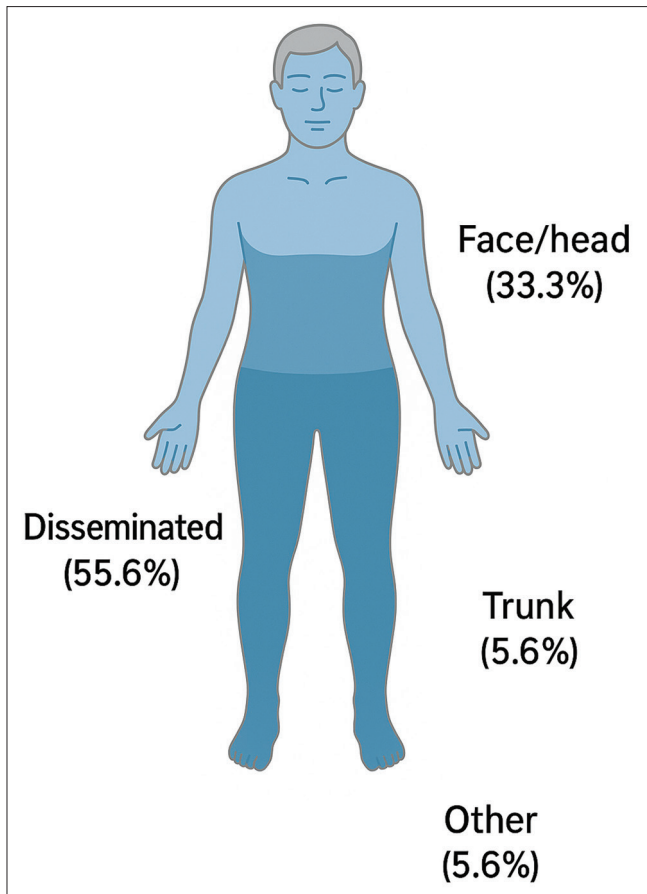


Figure 5: Anatomical distribution of lesions in patients with follicular mucinosis.

documented, ranging from early stages to tumor stages.

DISCUSSION

Our cohort showed a clear female predominance (73.7%), whereas in other reported series, the majority of cases showed a male predominance of up to 69.5–70% [13,14]. This striking contrast could reflect differences in population characteristics, a true geographical or genetic variation in the presentation of the disease. In terms of age, our cohort had a mean age of 31 years, indicating a presentation in younger patients compared to that described in other published series. In a series of 23 patients in Valencia, Spain [13], an average age of 48 years (range 11–78) was reported, while in a series of 33 patients reported by the Mayo Clinic [14], averages between 27 and 37 years were observed in primary variants and 54 years in cases secondary to lymphoma. These differences suggest that, in our population, follicular mucinosis tended to manifest earlier, which was probably related to a higher

proportion of primary and disseminated forms included in our cohort, while in the classic series, secondary forms associated with lymphoproliferative processes predominated. The main locations were the face and trunk (33.3% and 5.6%, respectively), in accordance with the literature, although cases were also documented in the extremities. The main challenge in diagnosis lies in its clinical similarity to other inflammatory dermatoses, particularly cutaneous lymphomas, mainly mycosis fungoides [15], which reinforces the importance of histopathological study. In our cohort, 26.3% ($n = 5$) of the patients had a confirmed diagnosis of mycosis fungoides with follicular involvement, ranging from early stages to the tumor stage. This proportion is highly similar to those described in other series [13–15], with reports of 27–32% associated with cutaneous T-cell lymphomas. However, relevant differences were observed in demographic characteristics: in the North American cohort [14], males predominated (70%), with a mean age of 48 years, whereas in the Spanish series [13], all secondary cases occurred in males, with a mean age of 54 years. In the Italian series [16], primary cases predominated in young women with solitary lesions located in the head and neck, while secondary cases occurred in older men with multiple lesions and extracranial localization.

In contrast, in our cohort, although females and younger age also predominated, cases associated with lymphoma were not limited to males or elderly patients. These findings reinforce the idea that, although the association frequency with lymphoma is consistent across populations, patients' clinical and demographic characteristics may vary, underscoring the need for a comprehensive diagnostic approach that includes clinical, histological, and immunogenetic criteria. Studies with larger, multicenter series are needed to determine whether these differences reflect regional variation or factors specific to each cohort.

CONCLUSION

In this series, MF showed a predominance in females and an earlier age of onset than that described in international series, with predominant involvement of the face and trunk; its diagnosis requires high clinical suspicion and histological confirmation. The contribution of this series lies in expanding knowledge of local epidemiology in Mexico and highlighting the importance of continuing multicenter studies to more accurately define the clinical behavior and prognosis

of follicular mucinosis in our population, despite its low frequency of presentation. Additional studies with a larger number of cases will allow for a better understanding of its epidemiology and association with other entities.

Statement of Human and Animal Rights

All the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the 2008 revision of the Declaration of Helsinki of 1975.

Statement of Informed Consent

Informed consent for participation in this study was obtained from all patients.

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