

# CASES OF NOTE

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## Morgellons Disease in a 48-Year-Old Female With Dermatologic Complaints

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### ABSTRACT

Morgellons disease, a controversial, newly emerging skin disease, is not usually included in the differential diagnosis of patients presenting to the emergency department with dermatologic complaints. Delay in diagnosis may result in months or years of suffering for patients who are routinely misdiagnosed with incorrect psychiatric or dermatologic conditions. A patient's case is presented in this article. The patient history, differential diagnosis, and distinctive features of Morgellons disease are discussed so that advanced practice nurse and physician providers may gain a knowledge base for clinical practice. **Key words:** advanced practice nurse, clinical nurse specialist, delusions of parasitosis, dermatologic disorders, Morgellons disease, nurse practitioner, parasthesia

**M**ORGELLONS DISEASE (MD) is a newly emerging, poorly understood skin condition in which lesions erupt on intact skin and unusual fibers push their way through the skin causing pain and itching. Morgellons disease patients also com-

plain of fatigue, body pain, and cognitive dysfunction, and the disease has been associated with a previous or concurrent Lyme disease diagnosis (Savely & Stricker, 2010). Most commonly, patients report a bite or finger prick with an unclean object before initiation of their symptoms.

Dermatologic complaints of rashes, lesions, and eruptions are common presenting problems in emergency departments (ED), urgent care clinics, and primary care offices. Because MD is not known or accepted by most of the medical community, patients typically access health care settings multiple times before a proper diagnosis is made (Savely & Stricker, 2010). Because physical and laboratory findings are nonconclusive in MD patients, patients are routinely offered discharge

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instructions for treatment of other dermatologic conditions, including scabies, atopic dermatitis, neurodermatitis, folliculitis, impetigo, or prurigo nodularis (Savely & Stricker, 2010).

Unfortunately, patients who present to the ED with lesions and paresthesias may also be incorrectly labeled with a psychiatric diagnosis (Savely & Stricker, 2010). These psychiatric diagnoses include self-mutilating behavior or other axis I or II mental health disorders which manifest in skin picking, including delusions of parasitosis (DP), and illicit drug-induced psychosis. Thus, MD patients leave the ED without resolution of their symptoms and with the stigma of an inappropriate psychiatric diagnosis.

This article will provide advanced practice nurse (APN) and physician ED providers insight into a disease that is unknown or misunderstood by most of the medical community. Emergency department health care providers would do well to become aware of the specific, recurrent complaints of MD patients and the distinctive physical findings that may indicate the need for referral to a specialist for a suspected MD diagnosis.

## FACT-BASED CASE

### History of Present Illness

A 48-year-old female patient presented to the ED, stating that 2 weeks prior she had begun to break out in open sores all over her body after pricking herself on a rose thorn while gardening. Since then she had experienced almost-constant pruritis over most of her body and a sensation of something crawling all over and under her skin. Recently, she had begun to experience intense pain secondary to “fibers and other debris” pushing out through areas of open skin. Ibuprofen and diphenhydramine had not ameliorated her symptoms.

The patient had visited her primary care physician (PCP) for her symptoms 5 days before but was not thoroughly examined and was told that she was delusional and picking at herself. The patient declined to take the an-

tipsychotic prescribed to her by the PCP, refusing to believe that she was delusional.

The pain, itching, and crawling sensations under the skin had become so unbearable that the patient presented to the ED because she felt she could not stand one more night without some relief. The patient brought a small glass container to the ED containing different shapes and sizes of fibers that she reported had come out of her body. She adamantly insisted that she was not delusional and that even though she knew what she was describing sounded crazy, it was in fact painful, frightening, and very real.

### Past Medical History

The patient had a negative medical history, except for a history of Lyme disease 5 years before, which had apparently resolved following a month of antibiotics. She denied a history of depression, anxiety, or psychoses.

### Current Medications

She denied the use of prescription medications, herbals, or supplements. She had used ibuprofen 800 mg q 8 hours and diphenhydramine 50 mg q 6 hours for the previous week.

### Allergies

Patient reported an allergy to penicillin with a reaction of hives and shortness of breath. She denied other medication allergies or food allergies.

### Immunizations

Patient reported being up-to-date with all immunizations with last tetanus booster 4 years before.

### Past Hospitalizations/Surgeries

She was hospitalized for C-section 25 years before, secondary to cephalopelvic disproportion.

**Table 1.** Review of systems

HEENT	Positive for frequent headaches, hair loss, change in hair texture (coarser) light headedness, dizziness, photophobia, transient blurry vision, floaters, tender gums, and crumbling teeth. Occasional ear and throat pain.
Neck	Positive for stiff, achy neck and tender but not enlarged cervical nodes.
Pulmonary	Negative for cough and shortness of breath or wheezing.
Cardiac	Positive for palpitations and fast heart rate. Denied chest pain or chest pressure.
Gastrointestinal	Positive for abdominal bloating and discomfort. Denied diarrhea, constipation, or sharp abdominal pain.
Urologic	Positive for frequent urination with black fibers and black specs seen in urine. Denied dysuria or hematuria.
Gynecologic	Noncontributory.
Musculoskeletal	Positive for aching in almost all muscles, which was alleviated with 800 mg ibuprofen. c/o migratory joint pain in knees, ankles, shoulders, and elbows. Nonsteroidal anti-inflammatory drugs did not relieve joint pain.
Hematologic	Positive for easy bruising and bleeding gums.
Neurologic	Positive for insomnia, fatigue, tingling in hands and feet, inability to process new information, short-term memory loss, mental confusion, clumsiness, and muscle weakness.
Psychiatric	Positive for new onset of panic, anxiety, and depression. Denied auditory or visual hallucinations. Positive for contemplation of suicide but denied a plan.
Dermatologic	Positive for numerous spontaneously appearing open lesions all over the body but especially on the legs, arms, and back. Extremely itchy and painful. Reported the presence of black, blue, and white fibers extruding from the lesions as well as black specs resembling coffee grounds. Described a "slimy" feeling to the skin.

Note. HEENT = head, ears, eyes, nose, throat.

### Social History

The patient was an attorney and a mediator with a successful practice. She denied the current or past use of tobacco or of recreational or street drugs. She reported drinking about one glass of wine per week. She had been divorced for 15 years and was living with her adult son. She reported that her favorite hobbies were gardening, hiking, and camping.

### Family History

The patient reported that both of her parents were alive and well and on medications for hypertension. She had two siblings, one treated for depression and the other on medication for hypothyroidism. Her only child, a son, suffered from severe attention-deficit disorder. She denied a family history of diabetes, heart disease, lung disease, cancer, or psychosis.

### Review of Systems

A review of systems as reported by the patient can be seen in Table 1.

### Physical Examination

The patient was awake, alert, and oriented to person, place, and time. Fear and anxiety were noted as evidenced by rapid speech, fidgeting, and diaphoresis.

### Vital signs

Temperature was 97.4° F. Blood pressure was 140/90 mmHg. Heart rate was regular but tachycardic at 104 beats per minute. Respiratory rate was 20 breaths per minute. Pulse oximetry was 98% on room air. Pertinent physical findings were dermatologic and neurologic (see Table 2).

**Table 2.** Physical examination

General	Patient was well dressed and groomed, coherent and well spoken, and in moderate distress.
HEENT	Hair appeared dry and coarse. Pupils equal, round, reactive to light and accommodation. Sinuses nontender.
Neck	Cervical nodes tender but not enlarged. Thyroid barely palpable and without nodes.
Pulmonary	Lungs clear to auscultation in all fields.
Cardiac	RRR with barely audible murmur at S1. Retake of BP after patient had calmed down was 132/82. Pulse dropped from the intake rate of 104 to 90.
Gastrointestinal	Abdomen mildly tender to palpation in all quadrants. Normal bowel sounds without bruits.
Genitourinary	Deferred.
Neurologic	Patient able to recall 2 out of 3 words; able to spell WORLD backwards but with hesitation; patellar DTRs 3+; positive Romberg.
Dermatologic	Gross examination: Open lesions covered the vast majority of the patient's legs, arms, and back. Some of the back lesions were in areas that the patient was unable to reach with her hands. Lesions averaged about 5 mm in width and were without purulent discharge or surrounding erythema. Scattered among the lesions were both hyper-pigmented and hypo-pigmented scars where lesions had healed. Microscopic examination: With lighted 100+ magnification, examination of the lesions revealed embedded black, blue, and red thread-like fibers. A white fiber on patient's left forearm was protruding through the outer dermis but was highly resistant to extraction. Patient complained of extreme pain radiating up the entire left arm when extraction was attempted.

Note. RRR = Regular rate and rhythm; BP = blood pressure; HEENT = head, ears, eyes, nose, throat; DTRs = Deep tendon reflexes.

### Differential Diagnosis

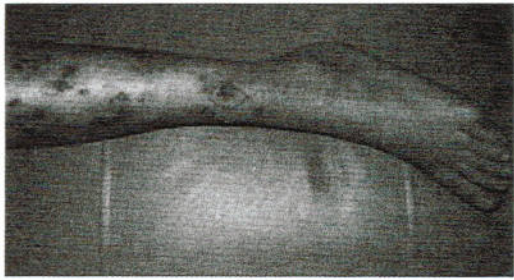
The differential diagnosis for a patient presenting with the concurrent symptoms of lesions, itching, and a feeling of crawling under the skin includes (a) DP, (b) formication due to methamphetamine abuse, (c) self-mutilation due to picking behaviors, and (d) scabies. Morgellons disease is sometimes misdiagnosed as other dermatoses that do not actually share all 3 of the above-mentioned features. These include impetigo, atopic dermatitis, neurodermatitis, folliculitis, and prurigo nodularis.

### Delusions of parasitosis

Patients with DP present to the ED with symptoms of itching, crawling, and biting sensa-

tions under the skin, and the fixed belief that they are infested with parasites. There may be open lesions on the skin because of the patient's attempt to extract the presumed parasite (Dunn, Murphy, & Fox, 2007; see Figure 1). Presentation of "evidence" is a common behavior with DP patients. The "matchbook sign," where patients present the debris that exits their skin in a matchbox, has become part of the diagnostic criteria (Dunn et al., 2007; Koo & Lebwohl, 2001). Apart from the perceived parasitic infestation, the DP patient presents without any notable signs or history of physical or mental impairment (Koo & Gambla, 1996).

On examination, the skin in the DP patient is nonintact to varying degrees, but no causative organisms or parasites are



**Figure 1.** Lower leg of Morgellons patient showing multiple open lesions (courtesy of TBD Medical Associates).

identified. Fibers are not visualized under the skin using lighted magnification. It behooves the clinician to investigate the possibility of metabolic causes for the patient's symptoms, including anemia; thyroid, liver, or kidney disease; toxins; or vitamin deficiency. In the absence of a physical cause, an evaluation of underlying psychiatric disorders is critical. The psychiatric differential for DP includes paranoid schizophrenia, bipolar disorder, anxiety disorder, obsessive-compulsive disorder, and social isolation. A referral to a psychiatrist is necessary to rule out or to confirm the diagnosis of DP.

#### **Formication**

*Formication* is the recurrent sensation of crawling, biting, and pins-and-needle sensations on or under the skin and is seen in methamphetamine and cocaine abusers. A common term for this condition is "meth mites". Patients may present with multiple self-inflicted lesions that result from aggressive scratching or digging at the skin.

Patients with formication accept a diagnostic explanation that parasites are not the cause of their symptoms, whereas those with DP persist in believing that a parasitic infestation is the cause of their illness (Dunn et al., 2007; Koo & Lebwahl, 2001). Of note to the ED provider is the evolving evidence that the neurologic and psychotic symptoms of a cocaine or methamphetamine user may persist long after cessation of the drug use (Grelotti, Kanayama, & Pope, 2010).

Close examination of the skin with a 60x hand-held, lighted microscope will *not* reveal the subcutaneous fibers that are characteristic of the patients with MD.

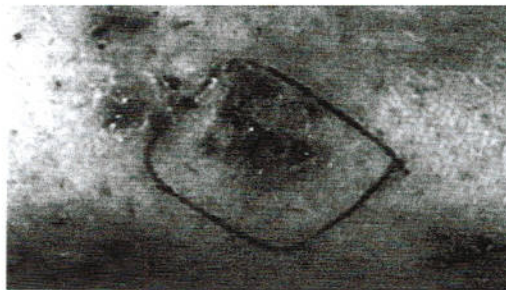
#### **Self-mutilation**

Axis I and axis II disorders are routinely accompanied by the reports of self-mutilation and present on a continuum from mild (mild anxiety disorder), resulting in nail biting or cuticle picking, to severe (borderline personality disorder), including life-threatening injuries. Women are believed to engage in self-mutilation in greater numbers than men; however, studies are inconclusive on this point (Klonsky, Oltmanns, & Turkheimer, 2003). Careful microscopic examination of the lesions as well as examination by a psychiatrist are necessary to differentiate a picking disorder from MD (see Figure 2).

#### **Scabies**

Scabies is the common name for the ectoparasitic mite *Sarcoptes scabiei*. The skin evidences inflammation and "burrows" created beneath the skin by the female mite, commonly on the wrists, the webbing between the fingers, the axillae, and the genitals (Centers for Disease Control and Prevention, 2008).

The primary symptom of *S. scabiei* infection is itching, typically worse at night, produced from a hypersensitivity/allergic reaction to the scybala (fecal matter), eggs, and other proteins from the mite (Walton & Currie, 2007). The itching and subsequent



**Figure 2.** Area of the same lower leg marked off for microscopic examination of selected lesion.

scratching can be so intense that the patient develops secondary infections, such as *Staphylococcus aureus* or  $\beta$ -hemolytic streptococci. Severe cases can lead to septicemia or a poststreptococcal glomerulonephritis (Walton & Currie, 2007).

A confirmative diagnosis of scabies is based on microscopic visualization of the mite from a skin scraping of the patient. However, if there are fewer than 20 mites per host, the probability of visualizing a mite is low. In the absence of the diagnostic visualization of the scabies mite, differentiation with MD can be based on the facts that MD patients do not have lesions in the characteristic distribution of scabies and that scabies patients do not have microscopic fibers within their lesions.

#### **Other dermatoses**

Other dermatoses that may be included in the differential include impetigo, atopic dermatitis, neuropathic dermatoses, folliculitis, and prurigo nodularis. Although these dermatoses may share certain symptoms with MD, namely itching, lesions, and/or paresthesias, the distinct feature that distinguishes MD from these and other dermatoses is the presence of microscopic, subcutaneous fibers that can be visualized with a 60x, lighted, hand-held microscope.

## **BACKGROUND**

Historical documents provide evidence that in 1674 the physician Sir Thomas Browne described a disease in French children that was known as “The Morgellons” (Harvey et al., 2009). This initial characterization and description of “The Morgellons” included unexplained dermal sensations with hair-like extrusions (Harvey et al., 2009). Awareness of the disease resurfaced in 2002 when Mary Leitao, a Pennsylvania mother of 3, found a fiber-filled lesion on the lip of her 3-year-old son. Leitao was unable to find answers for her son’s perplexing symptoms, and noticing the similarities with the 17th century disease described by Browne, she

borrowed the name Morgellons for her son’s condition.

In 2003, Leitao founded the Morgellons Research Foundation (MRF) and its website became an information and sharing center for people with similar symptoms. As of April 2010, 14,720 individuals with the symptoms of MD were registered on the MRF website (MRF, 2010).

The US Centers for Disease Control and Prevention (CDC) presently refers to MD as an “unexplained dermopathy” (CDC, 2010). There has been a significant number of formal legislative requests to increase research regarding MD (MRF, 2010). The CDC launched an information-gathering study to investigate MD in 2008, but at the time of this article’s publication, these findings have yet to be released (Department of Health & Human Services, 2008). Clinical and molecular research will be essential for further understanding of the disease process.

#### **Visualization of Fibers**

Much of the data and currently published research on MD was gathered from two subspecialty practices focusing on MD (Harvey et al., 2009; Savely & Stricker, 2010). Although the exact etiology of MD is unknown. The first author’s recently published statistical analysis of the symptoms of a clinically confirmed MD population ( $N = 122$ ) may be used as the foundation for a clinical case definition. (Savely & Stricker, 2010; see Table 3).

Theories about the fibers include that they may be (a) biological agents, (b) waste matter from biological agents, (c) byproducts of the body’s natural defenses to rid it of pathogens, or (d) an unrelated agent from an aberrant body system (MRF, 2010). Cutaneous or subcutaneous fibers visualized during microscopic examination are the hallmarks of MD (Savely & Stricker, 2010). Visualization of the red, blue, white, and/or black fibers is accomplished by using a 30x–100x hand-held magnifier to view the skin structures (see Figures 3 & 4). The texture of the fibers varies but may include subcutaneous, straight

**Table 3.** Top 10 Symptoms of Morgellons Disease on the basis of analysis of a clinically confirmed population with subcutaneous fibers

1. Crawling sensations under the skin.
2. Spontaneously appearing, slow-healing lesions.
3. Hyperpigmented scars when lesions heal.
4. Intense pruritis.
5. Seed-like objects coming out of the skin.
6. Black specs on intact skin.
7. "Fuzz balls" on intact skin.
8. Fine, thread-like fibers of varying colors in lesions and intact skin.
9. Lesions with thick, tough, translucent fibers that are highly resistant to extraction.
10. A sensation of something trying to penetrate the skin from the inside out.

hollow tubes, threads that are tangled and wiry, or cutaneous "fuzz balls" that are loosely clumped. Black specks approximately the size of coffee grounds may be visible to the naked eye. When examined under electron microscopic, the black specks reveal black fibers tightly woven together (Savely & Stricker, 2010).

Skin biopsies are routinely performed when patients present with inflamed epidermal tissue of unknown origin. Traditional pathology has often identified the fibers from biopsies of MD patients as "textile fibers" (Savely & Stricker, 2010). However, when Dr. Randy Wymore, director of the Oklahoma State University Morgellons Research Center,



**Figure 3.** Lesion visualized at 100× magnification.



**Figure 4.** Same lesion visualized at 200× magnification.

compared the fibers with an Federal Bureau of Investigation database of 100,000 known organic and inorganic compounds, MD fibers did not resemble any of them (Savely & Stricker, 2010). Wymore reports that biochemical analysis of the fibers is difficult due to the fact that the fibers are indestructible by high temperatures or caustic chemicals. Further investigation employing newer microarray technologies will be necessary to ascertain the exact origin and composition of MD fibers (Savely & Stricker, 2010).

Savely and Stricker (2010) also found significant associations between the following: (1) MD and tick-borne diseases; (2) MD and hypothyroidism; (3) high prevalence of MD cases in California and Texas; (4) high prevalence of MD cases among middle-aged White women; and (5) substance abuse higher than the national average (Savely & Stricker, in press).

### Pathophysiology of Morgellons

Presently, the agent of MD is unknown. Non-specific pathology or an inflammatory process with no implicated pathogen is the typical result of skin biopsies of MD patients performed at standard commercial laboratories (Savely, Leitao, & Stricker, 2006). Common laboratory abnormalities for MD patients include (a) elevated cytokines, (b) elevated inflammation markers, (c) immunodeficiency markers, (d) hematological abnormalities, and (e) biochemical abnormalities (MRE, 2010). Consistent findings of multiple biologic pathogens and non-pathogens

at abnormally high levels support an immune-deficiency state in MD patients. Because MD patients respond favorably to treatment with various antimicrobial agents, an unknown bacterial, fungal, or nematode infection has been surmised as the etiological agent.

### Association with Lyme disease

Savely and Stricker (2010) reported that a high percentage (97%) of MD patients in their research sample ( $N = 122$ ) had coexisting Lyme disease. The tick-borne pathogen implicated in Lyme disease is *Borrelia burgdorferi*, a spirochete.

A connection between *Borrelia* and the agent of MD has been postulated with the possibility of the first pathogen increasing susceptibility to the second (Savely & Stricker, 2007). Further speculation on the connection has focused on the possibility that MD may originate from a tick bite. Ticks carry multiple pathogens which have not all been identified (Savely & Stricker, 2007). The reason for the association between MD and Lyme disease remains unknown.

### PSYCHOLOGICAL IMPLICATIONS

Savely and Stricker (2010) reported that the length of time between onset of symptoms and presentation to subspecialty care for MD diagnosis (after removal of 2 outliers) was between 1 month and 20 years ( $N = 110$ ). Patients who report symptoms of MD are often initially dismissed as delusional (Savely & Stricker, 2010). Savely et al. (2006) surmised that MD may “trigger secondary psychopathology that may be wrongly confused with a primary delusional disorder.” (p. 3).

Psychopathology may be the result of an undiagnosed physical illness that has been mistakenly diagnosed as a psychosomatic dermatitis. According to Savely and Stricker (2010) “the diagnosis of a delusional disorder must be based on the presence of a primary psychiatric disorder rather than an absence of known dermatopathology.” (p. 3). Savely and Stricker (2010) published results that suggested “Morgellons patients

appear to be distinct from patients with delusional disorders in terms of both demographics and symptomatology” (p. 15). For the Morgellons patient, being repeatedly dismissed as having solely a psychiatric or behavioral health diagnosis is emotionally devastating.

Many MD patients refuse to accept a psychiatric diagnosis and continue to insist that they suffer from a true pathology (Savely & Stricker, 2010). The search for a health care professional to validate the skin symptoms of MD may take many years (Savely & Stricker, 2010). Savely et al. reported patients routinely seek help from “10 to 40 physicians and report that their symptoms are not taken seriously.” (p. 2). This complaint is compounded by physicians frequently making a diagnosis of DP without a thorough physical examination. The patient’s open lesions are seen as evidence of self-mutilation (Savely et al.).

### PATIENT MANAGEMENT AND FINDINGS

Laboratory tests were ordered, including a complete blood count with differential, complete metabolic panel, urinalysis, and thyroid-stimulating hormone. A 3-mm punch biopsy of one of the lesions was obtained but the tough, embedded fibers made it difficult to extract the tissue. All laboratory-test results were normal, and the biopsy report indicated “inflamed tissue” with “apparent textile fibers.”

The diagnosis of MD was based on the patient’s symptoms and the microscopic visualization of unusual subcutaneous fibers, which are distinctive to MD. The patient was relieved to finally have a diagnosis and was referred to a nurse practitioner known to have a special interest in MD. A prescription for cortisone-impregnated tape was provided to cover the lesions, to expedite healing, and to provide some symptomatic relief.

### APN SIGNIFICANCE

Patients who access primary, urgent, or emergent care with symptoms of MD are urgently



at abnormally high levels support an immune-deficiency state in MD patients. Because MD patients respond favorably to treatment with various antimicrobial agents, an unknown bacterial, fungal, or nematode infection has been surmised as the etiological agent.

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#### APN SIGNIFICANCE

Patients who access primary, urgent, or emergent care with symptoms of MD are urgently

in need of open-minded APNs or physician providers who possess requisite knowledge of the disease. Advanced practice nurses have an obligation and duty to advocate for their patients in cases where prejudiced treatment may be at play.

Dermatologic complaints are very common. An advanced understanding of the signs and symptoms of MD is essential to effectively exclude MD from the differential diagnosis. For suspected MD cases, appropriate treatment includes referral to subspecialty care and referral to online resources such as [www.thenmo.org](http://www.thenmo.org) or [www.mrf.com](http://www.mrf.com). Patients with unexplained dermatologic complaints pose significant diagnostic and therapeutic challenges beyond the scope of primary, urgent, or emergent care. Prompt referral to appropriate subspecialist care may reduce the amount of time between onset of symptoms and diagnosis. Misdiagnosis and unfavorable outcomes can best be avoided with prompt, appropriate referral.

In today's complex health care environment, it is common for patients to visit ED settings multiple times when their symptoms are not successfully treated. An incorrect psychiatric diagnosis results in patient distress, alienation of loved ones, prejudice by future health care providers, and an unnecessary stigma on the patient's medical record. The informed APN or physician provider can intervene and take steps to break this cycle for MD patients.

## CONCLUSION

APNs practicing in primary, urgent, or emergent care settings must provide patient validation and reassurance even in the face of improbable-sounding symptoms. It is important to keep an open mind and not jump to hasty conclusions when faced with an unusual patient presentation. An awareness of MD and how it differs from similar dermatoses will assist the clinician in arriving at a proper diagnosis for the scores of patients who have heretofore been misdiagnosed with DP. Al-

though etiology and treatment of MD remain unknown, clinicians who are able to identify MD in the ED will at the very least be able to relieve patients of an incorrect and damaging psychiatric diagnosis.

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