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Relapse of Dermatomyositis as a Marker of Occult Malignancy: Current Evidence and Clinical Implications.

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Abstract

Background. Dermatomyositis (DM) is an idiopathic inflammatory myopathy associated with a markedly increased risk of malignancy. Although cancer screening at disease onset is now an established component of clinical care, the significance of disease relapse as a potential marker of occult malignancy remains incompletely defined. Increasing evidence suggests that recurrent muscle and skin manifestations, particularly when accompanied by treatment refractoriness, may reflect an underlying neoplastic process rather than isolated autoimmune activity.

Aim. To summarize current evidence regarding the relationship between relapse of dermatomyositis and malignancy, with a particular focus on epidemiology, serological risk stratification, pathophysiological mechanisms, and contemporary cancer-screening strategies.

Material and methods. A narrative review was conducted using PubMed, Scopus, and Web of Science databases. Original studies, cohort studies, systematic reviews, meta-analyses, and international guidelines published between 2001 and 2026 were included. Evidence concerning cancer-associated dermatomyositis, disease recurrence, myositis-specific autoantibodies, and malignancy screening was critically analyzed.

Results. The risk of malignancy is highest within the first years after DM onset and is particularly increased in patients with anti-transcription intermediary factor 1 γ (anti-TIF1 γ) and anti-nuclear matrix protein 2 (anti-NXP2) antibodies. Emerging evidence suggests that relapse of muscular and cutaneous disease activity, progressive weakness, and inadequate response to immunosuppressive therapy may precede the diagnosis of occult malignancy or signal cancer recurrence. Current international recommendations support risk-adapted screening strategies integrating serological, clinical, and demographic factors.

Conclusions. Relapse of dermatomyositis should prompt renewed consideration of an underlying malignancy, especially in patients with established risk factors. Autoantibody profiling and individualized cancer-screening protocols are central to the early identification of cancer-associated disease and may improve patient outcomes.

Keywords: dermatomyositis; malignancy; cancer-associated dermatomyositis; occult cancer; anti-TIF1 γ antibodies; relapse.

1. Introduction

Dermatomyositis (DM) is a heterogeneous autoimmune disease within the spectrum of idiopathic inflammatory myopathies (IIMs), characterized by skeletal muscle inflammation, distinctive cutaneous manifestations, and variable systemic involvement [1,2]. Among autoimmune rheumatic diseases, DM exhibits one of the strongest associations with malignancy, with cancer representing one of the major determinants of morbidity and mortality [3-5]. This relationship places DM at the intersection of autoimmunity, immune surveillance, and tumor biology and has established cancer screening as an integral component of disease management [2,5].

The risk of malignancy in patients with DM substantially exceeds that observed in the general population and is particularly pronounced during the first years following disease onset [3-5]. However, oncological risk is not uniformly distributed across disease subsets. Increasing evidence indicates that age at onset, clinical phenotype, and serological profile collectively shape the likelihood of cancer development, giving rise to distinct forms of cancer-associated disease [6,7]. In particular, the identification of myositis-specific autoantibodies has transformed contemporary risk stratification, with anti-transcription intermediary factor 1 gamma (anti-TIF1 γ) and anti-nuclear matrix protein 2 (anti-NXP2) emerging as the strongest serological predictors of malignancy [6,8-11].

Concurrently, advances in immunopathology have provided new insights into the biological mechanisms underlying the association between DM and cancer. Tumor-associated alterations in autoantigen expression, including somatic mutations and loss of heterozygosity involving proteins targeted by the immune response, are thought to initiate cross-reactive mechanisms directed against regenerating muscle and skin [12-14]. These findings support the concept that, in at least a subset of patients, DM represents a paraneoplastic syndrome arising from the interaction between anti-tumor immunity and tissue-specific autoimmunity [15].

These developments have reshaped approaches to oncological surveillance and culminated in the implementation of risk-adapted screening strategies aimed at the early detection of occult malignancy [16-19]. Nevertheless, contemporary paradigms remain focused predominantly on the period surrounding disease onset, whereas the significance of disease recurrence during long-term follow-up remains incompletely understood [17-19]. Although cancer screening at diagnosis is now guided by international recommendations, evidence-based approaches to the management of recurrent disease activity remain limited [16].

In routine clinical practice, relapse of cutaneous manifestations, progressive muscle weakness, elevation of muscle enzyme concentrations, or loss of therapeutic response is frequently interpreted as evidence of uncontrolled autoimmune activity. However, accumulating data suggest that recurrent disease activity may, in some patients, precede the diagnosis of occult malignancy or reflect tumor recurrence, even after initially negative oncological investigations [20-22]. Distinguishing autoimmune relapse from paraneoplastic reactivation therefore represents a major clinical challenge, as delayed recognition of an underlying neoplasm may adversely affect both oncological and rheumatological outcomes [21,23,24].

Despite substantial progress in the understanding of cancer-associated DM, the role of relapse as a potential marker of malignancy has not yet been comprehensively synthesized [22]. Furthermore, important questions remain regarding the timing, intensity, and duration of oncological surveillance after the initial diagnostic evaluation, particularly in patients presenting with recurrent disease activity or treatment refractoriness [16,24].

Consequently, relapse of dermatomyositis should be viewed not only as a therapeutic challenge but also as a potential indicator of dynamic interactions between immune dysregulation and tumor evolution. Whether recurrent disease activity represents merely the reactivation of autoimmune inflammation or instead reflects the emergence or recurrence of malignancy remains one of the most important unresolved challenges in the long-term management of this disease.

Research Objective

To summarize current evidence regarding the relationship between relapse of dermatomyositis activity and occult malignancy, with particular emphasis on epidemiology, immunopathogenic mechanisms, serological risk stratification, and contemporary cancer-screening strategies.

Research Problems

1. Can relapse of dermatomyositis activity serve as a marker of occult malignancy or cancer recurrence?
2. Which clinical and serological factors are associated with an increased risk of cancer-associated dermatomyositis?
3. What immunopathogenic mechanisms link recurrent disease activity with tumor development?
4. Which screening strategies are currently recommended for patients with relapsing dermatomyositis?

Research Hypotheses

1. Relapse of dermatomyositis activity may precede the diagnosis of occult malignancy or indicate cancer recurrence.
2. Anti-TIF1 γ and anti-NXP2 antibodies identify patients at particularly high oncological risk.
3. Disease recurrence and treatment refractoriness should prompt renewed oncological evaluation.
4. Risk-adapted cancer-screening strategies improve the early detection of malignancy in patients with dermatomyositis.

2. Research Materials and Methods

Study Design

This study was conducted as a narrative review aimed at summarizing current evidence on the relationship between dermatomyositis relapse and occult malignancy, with particular emphasis on epidemiology, immunopathogenic mechanisms, serological risk stratification, and cancer-screening strategies.

Research Material and Procedure

A literature search was performed in the PubMed, Scopus, and Web of Science databases. Original studies, cohort studies, systematic reviews, meta-analyses, and international guidelines published in English between 2001 and 2026 were included.

The search strategy combined Medical Subject Headings (MeSH) and free-text terms related to dermatomyositis, malignancy, cancer-associated myositis, disease relapse, myositis-specific autoantibodies, and oncological surveillance.

Data Analysis

The retrieved literature was analyzed qualitatively and synthesized narratively, focusing on the epidemiology of cancer-associated dermatomyositis, mechanisms linking autoimmunity and malignancy, the clinical significance of disease relapse, and contemporary screening strategies. No formal quality assessment or risk-of-bias analysis was performed owing to the narrative design of the review.

Statistical Methods

No original statistical analyses were performed.

Artificial Intelligence Statement

Artificial intelligence tools were used exclusively to improve language clarity and text organization. All scientific content, interpretation of the literature, and editorial decisions were critically reviewed by the authors, who assume full responsibility for the accuracy and integrity of the final manuscript.

3. Research Results

3.1. Epidemiology and Temporal Relationship Between Dermatomyositis and Malignancy

Dermatomyositis (DM) is one of the autoimmune diseases most strongly associated with malignancy. Population-based studies and meta-analyses have consistently demonstrated a markedly increased cancer risk among patients with DM compared with the general population, with the highest incidence observed around the time of disease onset [3-5,25]. Although malignancy may occur throughout the disease course, the risk peaks within the first years following diagnosis and gradually declines thereafter [4,21,25].

Most malignancies are diagnosed within three years before or after the onset of muscular and cutaneous manifestations, supporting the concept that the temporal relationship between cancer and DM is not coincidental [20,21]. Nevertheless, an increased oncological risk persists beyond this period, emphasizing the importance of long-term vigilance and individualized follow-up strategies [17,19].

The spectrum of malignancies associated with DM varies according to age, sex, ethnicity, and geographic region. Ovarian, lung, pancreatic, gastric, and colorectal cancers, as well as non-Hodgkin lymphoma, are among the most frequently reported malignancies, whereas nasopharyngeal carcinoma represents an additional risk in selected Asian populations [5,19,21].

These epidemiological observations have reshaped the understanding of DM, shifting the paradigm from a purely autoimmune disorder toward a heterogeneous syndrome encompassing distinct clinical phenotypes, including cancer-associated dermatomyositis [21,24,26]. Consequently, contemporary research has increasingly focused on identifying patients at highest oncological risk and refining surveillance strategies throughout the disease course [16-19,27].

3.2. Clinical and Serological Risk Stratification in Cancer-Associated Dermatomyositis

The risk of malignancy in DM is not uniformly distributed but is determined by a complex interplay of demographic, clinical, and immunological factors. Increasing evidence suggests that specific phenotypes of dermatomyositis carry substantially different oncological risks, highlighting the need for individualized risk assessment [21,25,28].

Several clinical characteristics have been consistently associated with an increased probability of occult malignancy, including older age at disease onset, male sex, dysphagia, constitutional symptoms, severe muscle weakness, extensive cutaneous involvement, skin necrosis, and rapidly progressive disease [21,28]. Importantly, recurrent disease activity and inadequate response to immunosuppressive therapy have emerged as additional warning signs that may warrant renewed oncological investigation [22,35].

The discovery of myositis-specific autoantibodies has fundamentally transformed cancer risk stratification [8]. Anti-transcription intermediary factor 1 gamma (anti-TIF1 γ) antibodies are currently regarded as the strongest serological predictor of cancer-associated DM, particularly among older adults [6,9,11,31]. Likewise, anti-nuclear matrix protein 2 (anti-NXP2) antibodies

have been associated with an elevated malignancy risk, although the strength of this association appears more heterogeneous [6,10].

In contrast, selected serological subsets, particularly those associated with interstitial lung disease, appear to confer a comparatively lower oncological risk [29]. The integration of demographic factors, clinical manifestations, and autoantibody profiles has therefore become central to contemporary screening strategies and forms the basis of current risk-adapted approaches [16,17,36,37].

3.3. Immunopathogenic Mechanisms Linking Dermatomyositis and Malignancy

Although the epidemiological association between DM and malignancy is firmly established, the underlying biological mechanisms remain incompletely understood. Current evidence supports the concept that, in at least a subset of patients, dermatomyositis represents a paraneoplastic syndrome arising from the interaction between anti-tumor immunity and tissue-specific autoimmune responses [21,32].

Tumor cells may exhibit altered expression of proteins targeted by the immune system, including somatic mutations, overexpression of autoantigens, and loss of heterozygosity [12,13]. These alterations are thought to initiate immune responses directed against neoplastic tissue that subsequently cross-react with structurally related antigens expressed in regenerating muscle fibers and skin [13,14].

Particular attention has focused on proteins belonging to the transcription intermediary factor 1 (TIF1) family. Genetic abnormalities involving these proteins have been identified in tumors from patients with cancer-associated dermatomyositis, providing mechanistic support for the hypothesis that autoimmune inflammation may develop as an unintended consequence of anti-tumor immunity [12,30,32].

In addition to humoral responses, cellular immune mechanisms involving cytotoxic T lymphocytes, B cells, dendritic cells, pro-inflammatory cytokines, and type I interferon signaling pathways contribute to tissue injury and disease progression [14,24,32]. Collectively, these findings suggest that dermatomyositis arises from a dynamic interplay between immune surveillance, tumor evolution, and tissue-specific autoimmunity [14,21,32].

Importantly, these observations raise the possibility that, in selected patients, disease relapse reflects renewed tumor-driven immune activation, thereby linking recurrent clinical manifestations with the evolution of the underlying neoplastic process [12,30,32].

3.4. Relapse and Treatment Refractoriness as Clinical Markers of Occult Malignancy

Although the association between newly diagnosed dermatomyositis and malignancy has been extensively investigated, the clinical significance of disease relapse remains considerably less well understood. In routine practice, recurrent cutaneous manifestations, progressive muscle weakness, elevated muscle enzyme concentrations, and deterioration in functional status are frequently interpreted as evidence of uncontrolled autoimmune disease. However, accumulating evidence suggests that recurrent disease activity may, in some patients, precede the diagnosis of occult malignancy or signal tumor recurrence [20-22].

Distinguishing autoimmune flare from paraneoplastic reactivation represents one of the most important challenges in the long-term management of DM. Both conditions may present with similar manifestations, including worsening muscle weakness, dysphagia, constitutional symptoms, and laboratory abnormalities, making differentiation based solely on clinical findings difficult [21,35].

Several clinical features should raise suspicion of an underlying malignancy and prompt reconsideration of oncological evaluation. These “red flags” include relapse after prolonged remission, rapid disease progression, newly developed constitutional symptoms, unexplained weight loss, dysphagia, the emergence of additional systemic manifestations, and loss of response to previously effective immunosuppressive therapy [22,28,35]. Particular caution is warranted in patients with established risk factors, including advanced age and positivity for anti-TIF1 γ or anti-NXP2 antibodies [6,10,11,31].

The biological plausibility of this association is supported by current concepts of cancer-associated autoimmunity. Because anti-tumor immune responses and autoimmune inflammation appear to arise from shared pathogenic pathways, changes in tumor burden may influence disease activity and contribute to clinical relapse [12–14,30,32]. Consequently, treatment refractoriness should not automatically be interpreted as insufficient immunosuppression but should instead prompt renewed consideration of an occult neoplastic process [21,32].

Despite these observations, evidence-based recommendations regarding the management of relapsing dermatomyositis remain limited. Current screening guidelines focus predominantly on the period surrounding disease onset and provide relatively little guidance regarding recurrent disease activity, treatment-resistant cases, or the duration of long-term surveillance [16-18,35].

Whether relapse represents an independent predictor of malignancy remains uncertain. Nevertheless, recurrent disease activity should not be regarded solely as a manifestation of autoimmune reactivation but rather as a potential clinical warning sign requiring individualized reassessment for occult cancer [16,22,35].

3.5. Contemporary Cancer Screening, Clinical Implications, and Future Directions

The growing recognition of cancer-associated dermatomyositis has led to the development of increasingly sophisticated screening strategies based on demographic, clinical, and serological risk factors. Contemporary recommendations advocate comprehensive oncological evaluation at diagnosis, particularly in patients with high-risk features [16,17,19].

Depending on the clinical context, screening protocols may include laboratory investigations, computed tomography, endoscopic procedures, gynecological evaluation, and whole-body positron emission tomography/computed tomography (PET/CT) [15,23,33,34]. Recent international recommendations have emphasized risk-adapted approaches aimed at balancing the benefits of early cancer detection against the risks and costs associated with extensive diagnostic testing [16,17,36,37].

However, substantial gaps in knowledge remain. Existing guidelines focus primarily on cancer detection at disease onset and provide limited guidance regarding the management of recurrent disease activity or treatment-refractory cases [16,17,35]. Consequently, clinicians are frequently faced with the challenge of deciding whether relapse should trigger renewed oncological investigation despite previously negative screening results [22,35].

From a practical perspective, recurrent disease activity in high-risk patients should encourage clinicians to reconsider the possibility of an underlying neoplastic process and to individualize surveillance strategies according to the patient's clinical course and serological profile [11,16,22].

Future studies should aim to determine whether relapse should be incorporated into formal risk-stratification algorithms and to establish evidence-based recommendations regarding the timing, intensity, and duration of oncological surveillance in patients with dermatomyositis [19,22,36,37].

Taken together, contemporary evidence supports a personalized approach to cancer screening that integrates clinical manifestations, autoantibody status, and disease course [16,17,36,37].

Whether recurrent dermatomyositis activity should be regarded as an independent marker of occult malignancy remains one of the most important unanswered questions in the field [22].

4. Discussion

The association between dermatomyositis (DM) and malignancy has traditionally been interpreted through the markedly increased cancer risk observed around the time of disease onset. Over the past two decades, however, advances in epidemiological studies, serological profiling, and immunopathological research have fundamentally reshaped this perspective, establishing DM as one of the autoimmune diseases most closely linked to neoplastic processes [2-4,8,10]. Nevertheless, despite substantial progress in understanding cancer-associated dermatomyositis, the significance of recurrent disease activity remains incompletely defined.

The present review highlights that relapse of dermatomyositis represents one of the most clinically relevant yet least explored aspects of the interplay between autoimmunity and malignancy. Contemporary diagnostic paradigms focus predominantly on cancer detection at disease onset, whereas the implications of recurrent muscle and cutaneous manifestations during long-term follow-up have received comparatively little attention [16-18,35]. Consequently, disease recurrence is frequently interpreted as evidence of uncontrolled autoimmune inflammation or inadequate immunosuppressive therapy, despite accumulating observations suggesting that, in selected patients, relapse may precede the diagnosis of occult malignancy or accompany cancer recurrence [20-22].

This uncertainty reflects a broader conceptual challenge in the management of dermatomyositis: determining whether recurrent disease activity represents a simple resurgence of autoimmune inflammation or instead constitutes a clinical manifestation of ongoing tumor evolution. In routine practice, distinguishing between these scenarios remains difficult because autoimmune flare and paraneoplastic reactivation share many clinical and laboratory features, including progressive muscle weakness, worsening skin disease, dysphagia, constitutional symptoms, and elevations in muscle enzyme concentrations [18,21,35]. As a result, reliance on clinical presentation alone may lead either to delayed oncological diagnosis or to excessive diagnostic investigations.

The biological plausibility of relapse as a marker of occult malignancy is supported by advances in the understanding of cancer-associated autoimmunity. Experimental and translational studies have demonstrated that tumor cells may exhibit somatic mutations, overexpression of autoantigens, and loss of heterozygosity involving members of the transcription intermediary

factor 1 (TIF1) family [12-14,32]. At the same time, regenerating muscle fibers and inflamed skin express many of the same antigens targeted during anti-tumor immune responses, creating the conditions for cross-reactive tissue injury [13,14]. These findings support the concept that anti-tumor immunity and autoimmune inflammation arise from overlapping biological pathways rather than representing entirely independent processes.

From this perspective, fluctuations in disease activity may mirror changes occurring within the underlying neoplastic process. Rather than representing an isolated resurgence of autoimmunity, relapse could reflect renewed immune recognition of tumor-associated antigens and persistent interactions between malignant transformation and immune dysregulation [12,13,32]. Although direct evidence linking disease recurrence to occult malignancy remains limited, this hypothesis provides a coherent mechanistic framework capable of explaining the close temporal relationship between dermatomyositis activity and cancer development.

The identification of myositis-specific autoantibodies has transformed contemporary approaches to cancer risk stratification and surveillance [8,14]. In particular, anti-transcription intermediary factor 1 gamma (anti-TIF1 γ) antibodies are currently regarded as the strongest serological predictor of cancer-associated dermatomyositis, especially among older adults, whereas anti-nuclear matrix protein 2 (anti-NXP2) antibodies have also been consistently associated with an elevated risk of malignancy [6,7,9,20,22,31]. Conversely, selected clinical and serological phenotypes, particularly those characterized by interstitial lung disease, appear to exhibit a comparatively lower oncological risk [21,29]. Collectively, these observations emphasize that dermatomyositis comprises biologically distinct subgroups requiring individualized approaches to diagnosis, surveillance, and long-term follow-up.

The clinical implications of these findings are substantial. Particular caution appears warranted in patients presenting with relapse after prolonged remission, rapid clinical deterioration, constitutional symptoms, unexplained weight loss, dysphagia, newly emerging systemic manifestations, or loss of response to previously effective immunosuppressive therapy [20-23,28,35]. The coexistence of these features with high-risk autoantibody profiles, especially anti-TIF1 γ and anti-NXP2 positivity, should prompt clinicians to reconsider the possibility of occult malignancy, even in cases in which previous oncological investigations have yielded negative results.

Recent years have witnessed major progress in the development of standardized cancer-screening strategies for patients with inflammatory myopathies. The publication of risk-adapted

recommendations by the International Myositis Assessment and Clinical Studies Group (IMACS) represents a major milestone in the management of cancer-associated dermatomyositis, emphasizing the integration of demographic, clinical, and serological variables into individualized screening algorithms [16]. Subsequent validation studies have confirmed the utility of these recommendations while simultaneously underscoring the complexity of predicting malignancy in individual patients [36,37].

However, an important paradox remains. Although current screening algorithms are increasingly effective at identifying patients at high risk of cancer at the time of diagnosis, they provide only limited guidance regarding recurrent disease activity, treatment-refractory cases, and the optimal duration of surveillance [16-18,35]. Consequently, one of the most clinically relevant questions remains unanswered: should relapse itself trigger renewed oncological evaluation? Similarly, although imaging modalities such as whole-body positron emission tomography/computed tomography (PET/CT) have demonstrated promising diagnostic performance in the detection of occult malignancy, their precise role in patients with recurrent disease activity has yet to be fully established [15,33,34].

Several limitations of the current evidence base should also be acknowledged. Most available data derive from retrospective cohorts, observational studies, and case reports, whereas prospective studies specifically designed to investigate the relationship between disease relapse and malignancy remain scarce [21,22]. Furthermore, heterogeneity in study populations, variability in the definition of relapse, and differences in screening strategies complicate comparisons across studies and limit the development of evidence-based recommendations.

Taken together, the available evidence suggests that relapse of dermatomyositis may represent more than a simple recurrence of autoimmune inflammation. Although current data do not yet justify the incorporation of relapse as an independent criterion into formal cancer-screening algorithms, recurrent disease activity should prompt renewed consideration of an underlying malignancy, particularly in patients with established clinical and serological risk factors. Clarifying whether relapse constitutes an independent marker of occult malignancy will be essential for refining future surveillance strategies and may ultimately redefine the long-term management of patients with dermatomyositis. Future studies should therefore focus on validating relapse as a prognostic marker, optimizing follow-up protocols, and establishing evidence-based recommendations for the evaluation of recurrent disease activity [16,22,36,37].

5. Conclusions

Dermatomyositis is among the autoimmune diseases most strongly associated with malignancy, and the relationship between these conditions extends far beyond the period surrounding disease onset. Although substantial progress has been made in cancer risk stratification through the identification of clinical, demographic, and serological predictors, the significance of recurrent disease activity remains incompletely understood.

The evidence reviewed in this study suggests that relapse of dermatomyositis may represent more than a simple resurgence of autoimmune inflammation. In selected patients, recurrent muscle weakness, worsening cutaneous manifestations, treatment refractoriness, and the emergence of constitutional symptoms may reflect persistent interactions between tumor evolution and immune dysregulation. This concept is supported by growing insights into the immunopathogenesis of cancer-associated dermatomyositis, including tumor-associated alterations in autoantigen expression and cross-reactive immune responses involving regenerating muscle and skin [12-14,32].

Importantly, disease recurrence should not automatically be interpreted as a consequence of inadequate immunosuppressive therapy. Instead, relapse—particularly in patients with established risk factors such as advanced age, dysphagia, and positivity for anti-transcription intermediary factor 1 gamma (anti-TIF1 γ) or anti-nuclear matrix protein 2 (anti-NXP2) antibodies—should prompt renewed consideration of occult malignancy, even in the presence of previously negative oncological investigations [6,10,11,28,35].

The implementation of risk-adapted screening strategies, including the recommendations proposed by the International Myositis Assessment and Clinical Studies Group (IMACS), has significantly improved the early detection of malignancy in patients with dermatomyositis [16,36,37]. Nevertheless, current algorithms remain focused predominantly on the period surrounding diagnosis and provide only limited guidance regarding recurrent disease activity, treatment-refractory cases, and the optimal duration of long-term surveillance [16-18,35].

Although the available evidence does not yet justify the incorporation of relapse as an independent criterion into formal cancer-screening algorithms, recurrent disease activity should be recognized as a clinically meaningful warning signal warranting individualized oncological reassessment. Future prospective studies are needed to determine whether relapse constitutes an independent marker of occult malignancy and to establish evidence-based recommendations for the long-term management of patients with dermatomyositis [22,36,37].

Ultimately, clarifying the relationship between disease recurrence and cancer may not only refine future surveillance strategies but also fundamentally reshape the understanding and clinical management of cancer-associated dermatomyositis.

Disclosure:

Author Contributions

Conceptualization: Paulina Patrycja Turzyńska, Marcjanna Maria Liedtke

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Conflicts of Interest

The authors declare no conflict of interest.

Declaration of Generative AI and AI-Assisted Technologies

During the preparation of this work, the authors used ChatGPT-5.2 to improve grammar and language clarity. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

References

1. Dalakas MC, Hohlfeld R. Polymyositis and dermatomyositis. *Lancet*. 2003;362(9388):971-982. doi:10.1016/S0140-6736(03)14368-1
2. Lundberg IE, Fujimoto M, Vencovsky J, et al. Idiopathic inflammatory myopathies. *Nat Rev Dis Primers*. 2021;7(1):86. Published 2021 Dec 2. doi:10.1038/s41572-021-00321-x
3. Chen YJ, Wu CY, Huang YL, Wang CB, Shen JL, Chang YT. Cancer risks of dermatomyositis and polymyositis: a nationwide cohort study in Taiwan. *Arthritis Res Ther*. 2010;12(2):R70. doi:10.1186/ar2987
4. Yang Z, Lin F, Qin B, Liang Y, Zhong R. Polymyositis/dermatomyositis and malignancy risk: a metaanalysis study. *J Rheumatol*. 2015;42(2):282-291. doi:10.3899/jrheum.140566
5. Hill CL, Zhang Y, Sigurgeirsson B, et al. Frequency of specific cancer types in dermatomyositis and polymyositis: a population-based study. *Lancet*. 2001;357(9250):96-100. doi:10.1016/S0140-6736(00)03540-6
6. Fiorentino DF, Chung LS, Christopher-Stine L, et al. Most patients with cancer-associated dermatomyositis have antibodies to nuclear matrix protein NXP-2 or transcription intermediary factor 1 γ . *Arthritis Rheum*. 2013;65(11):2954-2962. doi:10.1002/art.38093
7. Yang H, Peng Q, Yin L, et al. Identification of multiple cancer-associated myositis-specific autoantibodies in idiopathic inflammatory myopathies: a large longitudinal cohort study. *Arthritis Res Ther*. 2017;19(1):259. Published 2017 Nov 25. doi:10.1186/s13075-017-1469-8
8. Betteridge Z, McHugh N. Myositis-specific autoantibodies: an important tool to support diagnosis of myositis. *J Intern Med*. 2016;280(1):8-23. doi:10.1111/joim.12451
9. Hida A, Yamashita T, Hosono Y, et al. Anti-TIF1- γ antibody and cancer-associated myositis: A clinicohistopathologic study. *Neurology*. 2016;87(3):299-308. doi:10.1212/WNL.0000000000002863
10. Bodoki L, Nagy-Vincze M, Griger Z, Betteridge Z, Szöllősi L, Dankó K. Four dermatomyositis-specific autoantibodies-anti-TIF1 γ , anti-NXP2, anti-SAE and anti-MDA5-in adult and juvenile patients with idiopathic inflammatory myopathies in a Hungarian cohort. *Autoimmun Rev*. 2014;13(12):1211-1219. doi:10.1016/j.autrev.2014.08.011
11. Kilinc OC, Ugurlu S. Clinical features of dermatomyositis patients with anti-TIF1 antibodies: A case based comprehensive review. *Autoimmun Rev*. 2023;22(12):103464. doi:10.1016/j.autrev.2023.103464

12. Pinal-Fernandez I, Ferrer-Fabregas B, Trallero-Araguas E, et al. Tumour TIF1 mutations and loss of heterozygosity related to cancer-associated myositis. *Rheumatology (Oxford)*. 2018;57(2):388-396. doi:10.1093/rheumatology/kex413
13. Casciola-Rosen L, Nagaraju K, Plotz P, et al. Enhanced autoantigen expression in regenerating muscle cells in idiopathic inflammatory myopathy. *J Exp Med*. 2005;201(4):591-601. doi:10.1084/jem.20041367
14. Casciola-Rosen L, Mammen AL. Myositis autoantibodies. *Curr Opin Rheumatol*. 2012;24(6):602-608. doi:10.1097/BOR.0b013e328358bd85
15. Selva-O'Callaghan A, Grau JM, Gámez-Cenzano C, et al. Conventional cancer screening versus PET/CT in dermatomyositis/polymyositis. *Am J Med*. 2010;123(6):558-562. doi:10.1016/j.amjmed.2009.11.012
16. Oldroyd AGS, Callen JP, Chinoy H, et al. International Guideline for Idiopathic Inflammatory Myopathy-Associated Cancer Screening: an International Myositis Assessment and Clinical Studies Group (IMACS) initiative. *Nat Rev Rheumatol*. 2023;19(12):805-817. doi:10.1038/s41584-023-01045-w
17. Oldroyd AGS, Allard AB, Callen JP, et al. A systematic review and meta-analysis to inform cancer screening guidelines in idiopathic inflammatory myopathies. *Rheumatology (Oxford)*. 2021;60(6):2615-2628. doi:10.1093/rheumatology/keab166
18. Trallero-Araguás E, Gil-Vila A, Martínez-Gómez X, et al. Cancer screening in idiopathic inflammatory myopathies: Ten years experience from a single center. *Semin Arthritis Rheum*. 2022;53:151940. doi:10.1016/j.semarthrit.2021.12.008
19. Liu S, Zhang Z, Yan S, et al. Risk, risk factors, and screening of malignancies in dermatomyositis: current status and future perspectives. *Front Oncol*. 2025;15:1503140. Published 2025 Jun 4. doi:10.3389/fonc.2025.1503140
20. Oldroyd A, Sergeant JC, New P, et al. The temporal relationship between cancer and adult onset anti-transcriptional intermediary factor 1 antibody-positive dermatomyositis. *Rheumatology (Oxford)*. 2019;58(4):650-655. doi:10.1093/rheumatology/key357
21. Tiniakou E, Mammen AL. Idiopathic Inflammatory Myopathies and Malignancy: a Comprehensive Review. *Clin Rev Allergy Immunol*. 2017;52(1):20-33. doi:10.1007/s12016-015-8511-x
22. Yerolatsite M, Kekkou E, Torounidou N, Gerolymatou N, Zarkavelis G, Voulgari PV. Cancer-associated dermatomyositis: A scoping review of the literature. *Autoimmun Rev*. Published online July 6, 2026. doi:10.1016/j.autrev.2026.104136
23. Khanna U, Galimberti F, Li Y, Fernandez AP. Dermatomyositis and malignancy: should all patients with dermatomyositis undergo malignancy screening?. *Ann Transl Med*. 2021;9(5):432. doi:10.21037/atm-20-5215

24. Selva-O'Callaghan A, Pinal-Fernandez I, Trallero-Araguás E, Milisenda JC, Grau-Junyent JM, Mammen AL. Classification and management of adult inflammatory myopathies. *Lancet Neurol.* 2018;17(9):816-828. doi:10.1016/S1474-4422(18)30254-0
25. Qiang JK, Kim WB, Baibergenova A, Alhusayen R. Risk of Malignancy in Dermatomyositis and Polymyositis. *J Cutan Med Surg.* 2017;21(2):131-136. doi:10.1177/1203475416665601
26. Mariampillai K, Granger B, Amelin D, et al. Development of a New Classification System for Idiopathic Inflammatory Myopathies Based on Clinical Manifestations and Myositis-Specific Autoantibodies. *JAMA Neurol.* 2018;75(12):1528-1537. doi:10.1001/jamaneurol.2018.2598
27. Lilleker JB, Vencovsky J, Wang G, et al. The EuroMyositis registry: an international collaborative tool to facilitate myositis research. *Ann Rheum Dis.* 2018;77(1):30-39. doi:10.1136/annrheumdis-2017-211868
28. Lu X, Yang H, Shu X, et al. Factors predicting malignancy in patients with polymyositis and dermatomyositis: a systematic review and meta-analysis. *PLoS One.* 2014;9(4):e94128. Published 2014 Apr 8. doi:10.1371/journal.pone.0094128
29. Lega JC, Reynaud Q, Belot A, Fabien N, Durieu I, Cottin V. Idiopathic inflammatory myopathies and the lung. *Eur Respir Rev.* 2015;24(136):216-238. doi:10.1183/16000617.00002015
30. Dani L, Holmqvist M, Martínez MA, et al. Anti-transcriptional intermediary factor 1 gamma antibodies in cancer-associated myositis: a longitudinal study. *Clin Exp Rheumatol.* 2020;38(1):67-73.
31. Best M, Molinari N, Chasset F, Vincent T, Cordel N, Bessis D. Use of Anti-transcriptional Intermediary Factor-1 Gamma Autoantibody in Identifying Adult Dermatomyositis Patients with Cancer: A Systematic Review and Meta-analysis. *Acta Derm Venereol.* 2019;99(3):256-262. doi:10.2340/00015555-3091
32. Selva-O'Callaghan A, Ros J, Gil-Vila A, Vila-Pijoan G, Trallero-Araguás E, Pinal-Fernandez I. Malignancy and myositis, from molecular mimicry to tumor infiltrating lymphocytes. *Neuromuscul Disord.* 2019;29(11):819-825. doi:10.1016/j.nmd.2019.09.014
33. Li X, Tan H. Value of ¹⁸F-FDG PET/CT in the detection of occult malignancy in patients with dermatomyositis. *Heliyon.* 2020;6(4):e03707. Published 2020 Apr 3. doi:10.1016/j.heliyon.2020.e03707
34. Yildiz H, D'abadie P, Gheysens O. The Role of Quantitative and Semi-quantitative [¹⁸F]FDG-PET/CT Indices for Evaluating Disease Activity and Management of Patients With Dermatomyositis and Polymyositis. *Front Med (Lausanne).* 2022;9:883727. Published 2022 Apr 15. doi:10.3389/fmed.2022.883727
35. Selva-O'Callaghan A, Martinez-Gómez X, Trallero-Araguás E, Pinal-Fernández I. The diagnostic work-up of cancer-associated myositis. *Curr Opin Rheumatol.* 2018;30(6):630-636. doi:10.1097/BOR.0000000000000535

36. Tang IYK, Chan SCW, Li PH, et al. Validation of the International Myositis Assessment and Clinical Studies Group guideline on cancer risk stratification. *Rheumatology (Oxford)*. 2025;64(4):2106-2114. doi:10.1093/rheumatology/keae504
37. Silva I, Dayanan J, Nigro A, et al. International Myositis Assessment and Clinical Studies Guidelines for Risk-Based Cancer Screening: An External Validation in Patients With Dermatomyositis Seen at a Metropolitan Academic Center. *ACR Open Rheumatol*. 2026;8(7):e90101. doi:10.1002/acr2.90101