

UNVEILING THE LINK BETWEEN VITILIGO AND SARCOIDOSIS: A CASE REPORT

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Summary

Aim of the study. To present a clinical case of sarcoidosis associated with vitiligo and to analyze scientific literature focusing on potential shared immunopathogenetic mechanisms, clinical characteristics, and the association between these conditions.

Methods. A clinical case report and a literature review were conducted using the international medical database “PubMed.” Relevant scientific publications addressing the pathogenesis, immunological mechanisms, and clinical associations of sarcoidosis and vitiligo were analyzed. **Results and conclusions.** Sarcoidosis is a systemic granulomatous disease most commonly affecting the lungs and lymph nodes, whereas vitiligo is a chronic autoimmune skin disorder characterized by melanocyte destruction and depigmented skin lesions. We report a clinical case of a 30-year-old male who was initially diagnosed with pulmonary sarcoidosis and later developed palmar vitiligo. The diagnosis of sarcoidosis was confirmed based on clinical, radiological, and histological findings, while vitiligo was diagnosed through dermatological and dermatoscopic examination. Literature data indicate that both diseases share similar immunopathogenetic pathways, including T-cell dysregulation, activation of the Th1/Th17 axis, cytokine imbalance, and genetic susceptibility. This case contributes to the growing body of evidence suggesting an association between sarcoidosis and vitiligo and highlights the importance of comprehensive patient evaluation in clinical practice.

Introduction

Vitiligo and sarcoidosis are immune-mediated disorders with distinct clinical manifestations. Vitiligo results from autoimmune destruction of melanocytes, leading to depigmented skin lesions [1, 2]. In contrast, sarcoidosis is

a systemic granulomatous disease of the lungs and lymph nodes with non-caseating granuloma formation [3]. Despite being distinct, both diseases share T-cell-mediated immune dysregulation, including Th1/Th17 responses and increased production of interferon- γ and TNF- α [2]. Emerging clinical and epidemiological evidence has suggested that these two disorders may coexist more frequently than by chance alone. Population-level analyses demonstrate a significant association between vitiligo and an increased risk of sarcoidosis, suggesting shared disease susceptibility [4, 5]. These findings have prompted further investigation into the clinical implications of this association [4].

Aim of the study. To present a clinical case of sarcoidosis associated with vitiligo and to analyze scientific literature focusing on potential shared immunopathogenetic mechanisms, clinical characteristics, and the association between these conditions.

Case report

The patient is a 30-year-old Caucasian Lithuanian male with a 10-year smoking history. In October 2023, a routine occupational chest X-ray revealed enlarged pulmonary hila. A chest CT performed in April 2024 demonstrated multiple small pulmonary nodules and mediastinal lymphadenopathy (Figure 1).

The patient was asymptomatic at that time. Pulmonary function testing in September 2024 showed a mild restrictive ventilatory defect (TLC 81%) and mildly reduced gas diffusion capacity (DLCO 71%). Bronchoscopy performed in October 2024 revealed bronchial mucosal nodules and indirect signs of lymphadenopathy. Histological examination demonstrated chronic non-necrotizing granulomatous inflammation. Bronchoalveolar lavage cultures and PCR testing excluded *Mycobacterium tuberculosis* and other infectious causes. Serum calcium levels were within normal limits. Based on clinical, radiological, and histological findings, pulmonary sarcoidosis was diagnosed. Subsequent whole-body PET/CT showed active sarcoidosis involving lymph

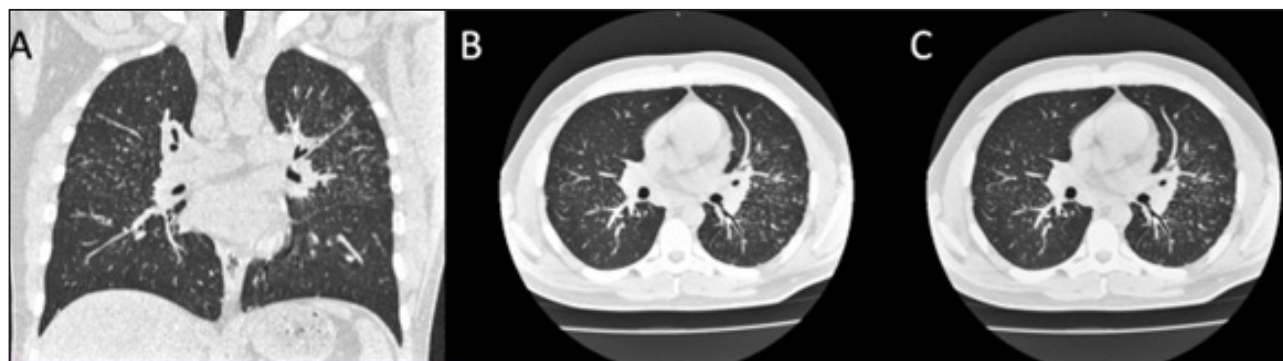


Figure 1. Chest CT shows bilateral pulmonary nodules and mediastinal lymphadenopathy.

A – coronal view; B and C – axial views at different levels.

nodes and the spleen. Suspected cardiac involvement was excluded after cardiology evaluation. As the patient remained asymptomatic with preserved pulmonary function, a conservative observational approach was chosen in accordance with current guidelines for stage I–II sarcoidosis. The patient remained under regular follow-up. In June 2025, the patient reported newly developed depigmented patches on the palms and was referred for dermatological evaluation. Clinical and dermatoscopic examination revealed structureless white areas with reduced pigment network and perilesional hyperpigmentation (Figure 2), consistent with vitiligo. Written informed consent was obtained for the use of clinical data and images.

Discussion

Sarcoidosis and vitiligo share overlapping immunological mechanisms, driven by genetic susceptibility and environmental or infectious triggers, highlighting the importance of understanding their underlying pathophysiology [1, 2]. In vitiligo, stress-related signals promote chemokine-mediated recruitment of autoreactive T cells to the skin [4, 6]. In sarcoidosis, antigen recognition by immune cells initiates granuloma formation [1, 8, 9]. Despite different tissue manifestations, both diseases share chronic immune dysregulation [2, 10]. In vitiligo, cytotoxic CD8⁺ T cells mediate melanocyte destruction, whereas sarcoidosis is characterized by CD4⁺ Th1-dominant granulomatous inflammation driven by interferon- γ and TNF- α production [6, 9]. In both conditions, impaired regulatory T-cell function contributes to persistent immune dysregulation and chronic inflammation [7, 9].

Th17/IL-17 signaling sustains inflammation in both diseases [2, 9]. In vitiligo, Th17-derived IL-17 amplifies skin inflammation and cytotoxic activity; however, this pathway is less dominant than IFN- γ [4, 6]. In sarcoidosis, Th17-derived IL-17 contributes to granuloma persistence and chronic inflammation [1, 9, 10]. Parallel Th1 and Th17 responses in both diseases reflect shared immune dysregulation [2, 9].

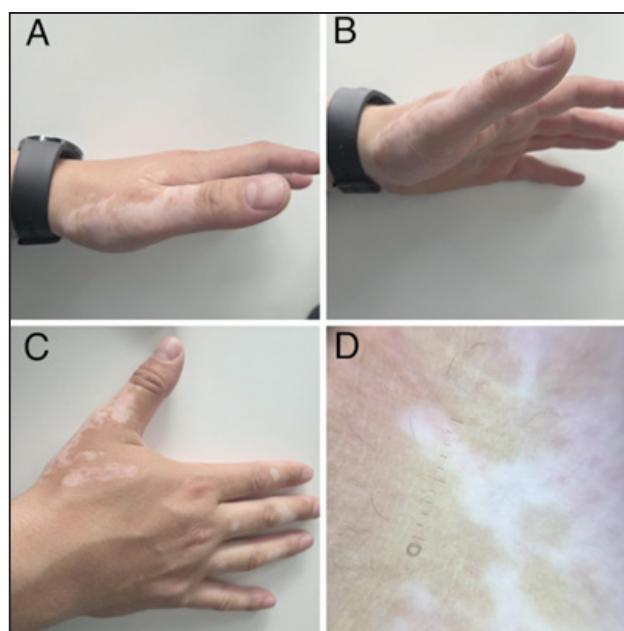


Figure 2. Pictures A, B and C - depigmented patches on the patient's left palm; D - dermatoscopic view showing depigmented areas without perifollicular pigmentation.

Additionally, genetic susceptibility may contribute to the coexistence of vitiligo and sarcoidosis, as HLA class II variants influence immune responses in vitiligo and HLA polymorphisms affect disease risk and organ involvement in sarcoidosis [6, 9, 10].

Conclusions

In conclusion, this case supports growing evidence that sarcoidosis and vitiligo may share overlapping immunological and genetic mechanisms. Both conditions involve T-cell dysregulation, cytokine imbalance, and altered antigen presentation, which may explain their occasional coexistence.

However, current evidence remains limited, and it is unclear whether this association reflects a true biological link or a coincidental overlap. Further clinical and molecular studies are needed to clarify this relationship and its potential diagnostic and therapeutic implications.

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VITILIGO IR SARKOIDOZĖS ŠĄSAJOS: KLINIKINIO ATVEJO ANALIZĖ

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Raktažodžiai: sarkoidozė, vitiligo, klinikinis atvejis, autoimuninės ligos, imunopatogenezė.

Santrauka

Tyrimo tikslas. Pristatyti klinikinį sarkoidozės ir vitiligo atvejį bei išanalizuoti mokslinę literatūrą apie galimus bendrus šių ligų imunopatogenetinius mechanizmus, klinikoje ypatumus ir tarpusavio sąsajas.

Metodai. Pateikiamas klinikinis atvejis ir atlikta literatūros apžvalga, naudojant tarptautinę medicinos duomenų bazę „PubMed“. Atrinkti aktualūs moksliniai straipsniai, nagrinėjantys sarkoidozės ir vitiligo patogenezę, imunologinius mechanizmus bei klinikoje sąsajas.

Rezultatai ir išvados. Sarkoidozė – tai sisteminė granulomatozinė liga, dažniausiai pažeidžianti plaučius ir limfmazgius, o vitiligo – lėtinė autoimuninė odos liga, pasireiškianti melanocitų nykimu ir depigmentuotomis odos dėmėmis. Pristatomas 30 metų vyro klinikinis atvejis, kuriam pirmiausia diagnozuota plaučių sarkoidozė, o vėliau delnuose išsivystė vitiligo. Sarkoidozės diagnozė patvirtinta remiantis klinikiniais, radiologiniais ir histologiniais duomenimis, o vitiligo – dermatologiniu ir dermatoskopiniu ištyrimu. Literatūros duomenys rodo, kad abi ligos pasižymi panašiais imunopatogenetiniais mechanizmais, įskaitant T limfocitų disbalansą, Th1/Th17 ašies aktyvaciją, citokinų perprodukciją ir genetinę polinkį. Šis klinikinis atvejis papildė gausėjančius duomenis apie galimą sarkoidozės ir vitiligo sąsają bei pabrėžia kompleksinio pacientų vertinimo svarbą klinikoje praktikoje.

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