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Letter to the Editor

British Society for Rheumatology RHEUMATOLOGY OXFORD

Letter to the Editor (Case report)

Juvenile dermatomyositis as a rare paraneoplastic manifestation of nasopharyngeal carcinoma

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Rheumatology key message

- Atypical manifestations in juvenile dermatomyositis should prompt thorough oncologic evaluation to exclude malignancy.

Dear Editor, Juvenile dermatomyositis (JDM) is the most common inflammatory myopathy in children, characterized by symmetrical proximal muscle weakness and typical skin findings, including heliotrope rash, Gottron's papules, periungual hyperemia, shawl sign and V sign, often involving multiple organs [1]. This rare autoimmune disease has an estimated prevalence of 2.5 per million children while generally treatable, severe JDM may lead to joint contractures, organ-specific sequelae or even mortality [1]. A well-established association links adult-onset dermatomyositis (DM) to malignancy, particularly in anti-TIF1 antibody-positive patients; however, this association is not typically observed in paediatric cases. JDM occurring as a paraneoplastic syndrome remains rare in the literature [2]. Herein, we report a 10-year-old male patient with JDM presenting with proximal muscle weakness, dysphonia, heliotrope rash, Gottron's papules on bilateral proximal interphalangeal, metacarpophalangeal, elbow and knee joints. Following a comprehensive evaluation, the patient was subsequently diagnosed with nasopharyngeal carcinoma (NPC).

A 10-year-old male presented with a two-month history of non-pruritic erythematous rashes on the cheeks, knees and elbows, accompanied by dysphonia and myalgia. His medical and family history was unremarkable. On examination, a heliotrope rash was evident on the face, and Gottron's papules were noted on the extensor surfaces of the bilateral proximal interphalangeal, metacarpophalangeal, elbow and knee joints (Fig. 1A–B). Proximal muscle strength was 4/5 in both proximal upper and lower extremities. The patient also exhibited adenoid facies and marked tonsillar hypertrophy. No pathological lymphadenopathy or hepatosplenomegaly were detected.

Initial laboratory investigations revealed leucocytosis with neutrophil predominance (white blood cell count: 14 900/μL; absolute neutrophil count: 10 500/μL; Hgb: 12.1 g/dl; PLT357x10e^3/uL); creatine kinase (CK: 397 U/l 68–293), aspartate aminotransferase (AST: 51 U/l 20–40), alanine aminotransferase (ALT: 41 U/l 15–35), lactate dehydrogenase (LDH: 567 U/l 195–349) were elevated. Erythrocyte sedimentation rate (ESR) 76 mm/h (0–15), C-reactive protein (CRP) 6.2 mg/l (<5 mg/l) were increased. Peripheral blood smear and infectious investigations were unremarkable. Antinuclear antibody (ANA) and anti-Ro52 were positive and complement levels and urinalysis were normal. Rheumatoid factor was negative. Myositis-specific autoantibodies (MSAs) were unavailable. Magnetic resonance imaging (MRI) demonstrated widespread myositis in the gluteal and thigh muscles. Electromyography (EMG) revealed myopathic changes. Neck CT demonstrated marked adenoidal hypertrophy leading to nasopharyngeal airway obliteration and mild oropharyngeal narrowing secondary to palatine tonsillar enlargement. The patient was diagnosed with JDM according to the Bohan and Peter criteria [3].

Initial treatment included intravenous pulse methylprednisolone for three days, weekly methotrexate (MTX) 15 mg/m^2, monthly intravenous immunoglobulin (IVIG) 2 g/kg and daily prednisolone at 1 mg/kg/day. Clinical improvement was noted within the first month, with increased muscle strength and reduced skin lesions. However, the patient developed limitation in right eye abduction. Paranasal sinus and cranial MRI revealed a 5.5 × 6 cm mass infiltrating the nasal cavity and destructing the skull base (Fig. 1C). Positron emission tomography showed no systemic involvement beyond increased 18F-FDG uptake in the nasopharyngeal mass. Histopathology revealed non-keratinizing nasopharyngeal squamous cell

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Figure 1. Clinical and radiological features of juvenile dermatomyositis (JDM) and associated nasopharyngeal carcinoma (NPC). (**A**, **B**) Gottron's papules, present at disease onset, were located over the metacarpophalangeal, proximal and distal interphalangeal, and knee joints (**C**). Axial T1-weighted magnetic resonance imaging showing a 5-cm mass lesion infiltrating the nasal passage and causing bony destruction of the skull base

carcinoma. The patient was diagnosed with paraneoplastic JDM secondary to NPC. Corticosteroids were gradually tapered, with continued monthly IVIG and weekly MTX. Following chemotherapy initiation, cutaneous lesions regressed and muscle strength significantly improved by the third month.

We report a rare paediatric case of paraneoplastic JDM secondary to NPC. Although adult-onset inflammatory myopathies are well-recognized to carry an increased malignancy risk, current evidence does not support a similar association in JDM, and routine malignancy screening is not recommended [4]. However, in the presence of persistent or atypical clinical findings, the possibility of an underlying malignancy should not be overlooked. In our patient, the lack of improvement in dysphonia with standard JDM treatment, and new-onset ocular abduction limitation prompted further evaluation, leading to the diagnosis of NPC. Following the diagnosis, immunosuppressive therapy was discontinued and the patient was referred for oncologic management. After initiation of chemotherapy, both systemic symptoms and neurological findings improved, including resolution of the ocular movement limitation and marked recovery in muscle strength.

A limited number of reports have illustrated diverse clinical courses in JDM, highlighting features suggestive of underlying malignancy [2, 3, 5, 6]. Shay *et al.* described a patient who developed supraclavicular lymphadenopathy months after JDM diagnosis, ultimately diagnosed as Hodgkin lymphoma (HL) [3]. Suzuki *et al.* also reported an 11-year-old girl with JDM presenting with fever, muscle weakness and lymphadenopathy; and subsequent biopsy confirmed HL, and her symptoms improving after chemotherapy [2]. Cannon *et al.* presented two patients with initial favourable response to JDM treatment who subsequently developed leukaemia; both cases preceded by prolonged prodromal symptoms, weight loss and cytopenia [5]. Martini *et al.* reported NPC in a JDM patient who initially presented with pathological lymphadenopathy and showed a significant clinical response to corticosteroid therapy – marked improvement in cutaneous manifestations, muscle strength and serum muscle enzyme levels – prior to the definitive malignancy diagnosis via lymph node biopsy [6]. NPC is rare in children, yet its incidence shows vast geographical differences: it is low in most industrialized countries but substantially higher in endemic regions such as southern China, Southeast Asia, Alaska and the Mediterranean Basin. Paediatric NPC is often distinct from the adult form due to its typical histology, frequent association with Epstein–Barr virus (EBV) infection, and generally more favorable prognosis [7]. In contrast, the association between adult-onset DM and NPC is well recognized, with a pooled prevalence of ∼29%, increasing to over 63% in highly endemic regions. EBV infection has been hypothesized to contribute to the pathogenesis of dermatomyositis through mechanisms such as molecular mimicry, EBV-induced proliferation of autoreactive B cells and dysregulated T-cell responses, suggesting a potential shared viral trigger between the two diseases [8]. In our case, the emergence of new, atypical clinical findings – specifically, the limitation in ocular movement – despite ongoing standard therapy (corticosteroids, MTX and IVIG), heightened the suspicion for an underlying neoplastic process, subsequently confirmed as NPC. Crucially, our patient exhibited neither the ethnic background typically associated with NPC endemicity nor evidence of EBV infection, further underscoring the truly exceptional nature of this association in a paediatric setting.

In conclusion, although current guidelines do not recommend routine malignancy screening for JDM patients, clinicians should maintain a high index of suspicion and consider advanced imaging and comprehensive oncologic evaluation in the presence of new or evolving focal symptoms (e.g. cranial nerve involvement, persistent focal pain, or atypical ocular signs), unexplained weight loss, pathological lymphadenopathy, or haematological abnormalities, as these may signal an underlying neoplastic process.

Data availability

Data sharing is not applicable as no new data was generated or analysed in support of this research, and the article describes a case report. Consent for publication has been duly obtained from the family. The authors extend their sincere gratitude to both the patient and his family.

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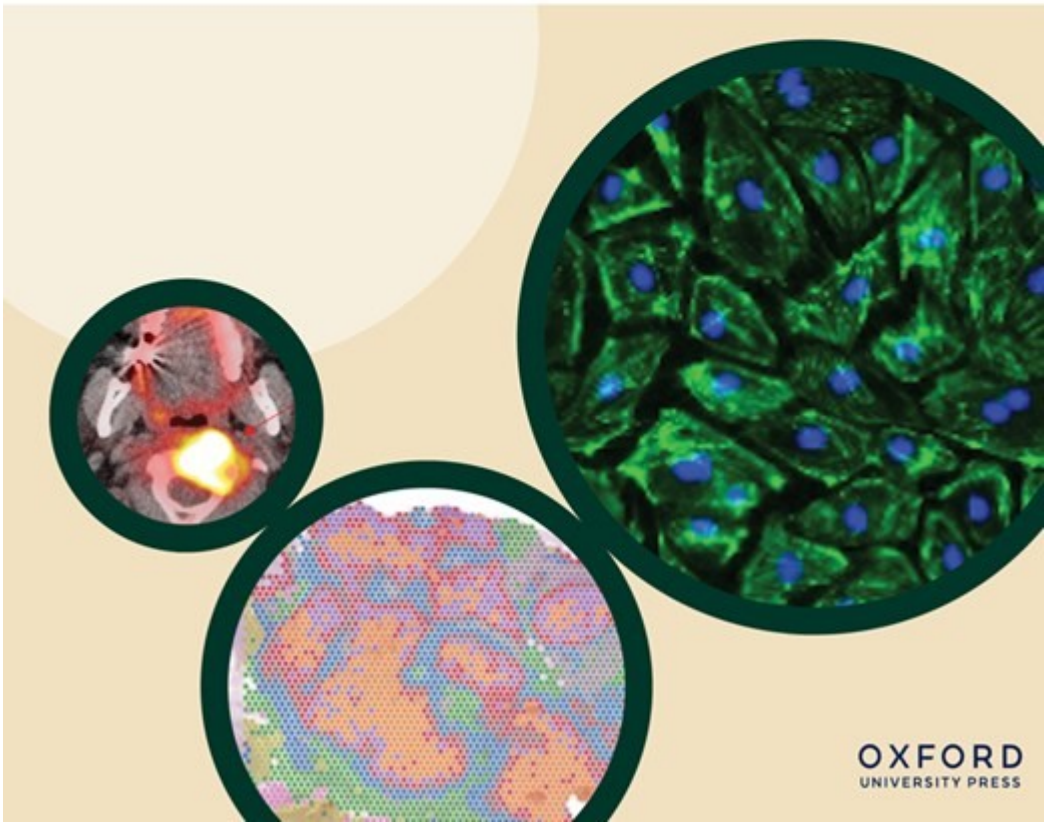
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