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CASE REPORT

Steroid-responsive proximal myopathy with dystrophic muscle biopsy in a young male: a diagnostic dilemma

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ABSTRACT

Background: Limb Girdle Muscular Dystrophy Type 2B (LGMD2B) can closely mimic polymyositis, particularly in young adults and may show misleading short-term steroid responsiveness. However, unlike inflammatory myopathies, they do not benefit from long-term immunosuppression, which may in fact accelerate muscle degeneration. **Case report**: We report the case of a 21-year-old male presenting with acute-onset progressive proximal muscle weakness and markedly elevated creatine phosphokinase levels. The clinical picture, along with a transient response to corticosteroids, initially suggested inflammatory myopathy of polymyositis. However, muscle biopsy revealed dystrophic features with minimal inflammation and autoimmune serologies were negative, suggesting an underlying muscular dystrophy, specifically LGMD2B. **Conclusion:** This case underscores the importance of a comprehensive diagnostic approach in patients with proximal myopathy. Overreliance on steroid responsiveness or elevated CPK levels can lead to misdiagnosis. Differentiating muscular dystrophies from inflammatory myopathies is essential to avoid unnecessary immunosuppression.

Keywords: Electromyography, Limb Girdle Muscular Dystrophy, Myopathy, Polymyositis, Proximal Muscle Biopsy, Serum Creatine Phosphokinase

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Introduction

Limb-girdle muscular dystrophies (LGMDs) are rare genetic muscle disorders, with some forms such as LGMD type 2B (LGMD2B) and Miyoshi myopathy, caused by mutations in the DYSF gene (1). The DYSF gene encodes dysferlin, an amino acid protein essential for muscle membrane repair. Loss of dysferlin impairs membrane resealing, leading to progressive muscle degeneration (2,3). LGMD2B typically presents with progressive proximal muscle weakness, while Miyoshi myopathy is characterized by distal especially calf involvement (1,4). LGMDs can occur at any age and usually follow a slowly progressive course, with prevalence estimates ranging from 0.8 to 5.7 per 100,000 individuals (5,6). Clinical severity varies widely due to genetic heterogeneity, ranging from mild adolescent-onset to more severe childhood presentations. Due to overlapping features with inflammatory myopathies, LGMDs are often misdiagnosed. Diagnosis relies on clinical history, elevated creatine

phosphokinase CPK, electromyography (EMG), muscle MRI and subsequent confirmation by genetic testing (7,8).

Herein, we report a case of a young male presenting with progressive proximal muscle weakness and elevated CPK, whose muscle biopsy revealed features consistent with muscular dystrophy. Prior to finding dystrophic histopathology, the patient demonstrated a marked clinical and biochemical response to corticosteroid therapy, supporting an initial misdiagnosis of polymyositis. This case highlights the diagnostic overlap between inflammatory myopathies and muscular dystrophies, and underscores the importance of comprehensive histopathological, serologic and genetic evaluation.

Case Presentation

A 21-year-old male presented with acute-onset, progressively worsening proximal muscle weakness over 3–4 weeks. He reported increasing difficulty with activities such as squatting, standing from a seated position, climbing stairs and combing his hair. There were no associated systemic features such as rash, joint pain, respiratory symptoms or constitutional complaints. Family history was negative for neuromuscular disorders, although his parents are first cousins. Laboratory investigations revealed markedly elevated serum creatine phosphokinase (CPK) at 16,000 IU/L. His complete blood count (CBC), erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), liver function tests (LFTs), renal function tests (RFTs), urine analysis and thyroid-stimulating hormone (TSH) levels were all unremarkable. MRI of the thigh and pelvic girdle muscles showed fatty and inflammatory changes. Electromyography showed a proximal myopathic pattern. A muscle biopsy and autoimmune profile were planned. Serology tests for human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV) and syphilis were negative.

Given the possibility of an inflammatory myopathy such as polymyositis, the patient was started empirically on corticosteroid therapy with intravenous methylprednisolone 1000mg for 5 days, followed by oral prednisolone at 0.5 mg/kg/day and azathioprine 2mg/kg/day. The muscle biopsy revealed findings consistent with a dystrophic process, including fiber size variation, internal nuclei, endomysial fibrosis and evidence of muscle fiber degeneration and regeneration, without significant inflammatory infiltrates. Autoimmune and myositis serologies including ANA, ENA, anti-Jo1, anti-SRP, anti-Ku and anti-RNP were all negative. Genetic testing was not pursued due to financial constraints. His chest X-ray, abdominal ultrasound, echocardiography and pulmonary function tests are all within normal limits.

The patient demonstrated marked clinical improvement in muscle strength and function after initiation of steroids, with a steady biochemical response: CPK levels declined from 16,000 to 8,000, then to 2,000, and normalized within 3 months. Based on his age, clinical features of proximal weakness, negative autoimmune profile, an initial response to steroids and muscle biopsy showing dystrophic changes, a diagnosis of Limb Girdle Muscular Dystrophy Type 2B (LGMD2B) was made. Azathioprine was discontinued meanwhile steroids were slowly tapered and stopped. Long-term follow-up was planned to monitor for disease progression. Counseling regarding rehabilitation, physiotherapy, orthotic support, cardiac echocardiography and

pulmonary function tests monitoring was done.

Discussion

This case highlights the diagnostic challenge of differentiating between inflammatory myopathies and muscular dystrophies in young adults presenting with acute proximal weakness, elevated creatine kinase, and an initial steroid response. These features suggest polymyositis, but the muscle biopsy in this patient showed a dystrophic pattern with minimal inflammation, and autoimmune markers were negative, pointing toward a muscular dystrophy, most likely LGMD2B. LGMD2B, also known as dysferlinopathy, is a known mimic of polymyositis and may show transient steroid responsiveness, leading to misdiagnosis (1,9). However, long-term immunosuppression offers no benefit and may worsen muscle loss. Unlike inflammatory myopathies, which typically show inflammatory infiltrates and respond to immunosuppressive therapy, LGMD2B shows dystrophic changes on biopsy and negative autoimmune serology (2,10). The differences between polymyositis and LGMD phenotypes are outlined in Tables 1 and Table 2. Accurate diagnosis is crucial to avoid inappropriate treatment and guide supportive care, including physiotherapy and regular cardiac and respiratory monitoring (11,12).

Table 1: Key Clinical Differences in LGMD Phenotypes and Polymyositis

Condition	Clinical Presentation	Muscles Involved	Age of Onset
Polymyositis	Symmetric proximal weakness	Shoulder and pelvic girdle	Any age
LGMD type 2B	Symmetric proximal weakness	Pelvic > shoulder girdle	Teens to 20s
Miyoshi Myopathy	Distal weakness	Gastrocnemius, soleus	Teens to 20s
Proximodistal Variant	Mixed proximal and distal weakness	Both proximal and distal	20s
Asymptomatic HyperCKemia	None (clinically silent)	No clinical weakness, incidental CK	Any age

Table 2: Key Investigate Differences in LGMD Phenotypes and Polymyositis

Condition	Autoimmune Profile	Muscle Biopsy Findings	Steroid Response
Polymyositis	Positive	Inflammatory infiltrates, necrosis	Yes, usually good response
LGMD Type2B	Negative	Dystrophic changes, minimal inflammation	Initial good but transient response
Miyoshi Myopathy	Negative	Dystrophic changes	Usually poor or transient
Proximodistal Variant	Negative	Dystrophic changes	Usually poor or transient
Asymptomatic HyperCKemia	Negative	Usually normal or mild dystrophic changes	No significant response

Conclusion

This case emphasizes the importance of considering genetic myopathies in young patients with myositis-like presentations. Long-term treatment decisions should not be solely based on steroid responsiveness, especially in young males with dystrophic muscle biopsy findings. A thorough diagnostic workup is essential before

committing to prolonged steroid use and immunosuppressant therapy.

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