Inclusion Body Myositis in a Middle-Aged Woman With Knee Pain and Weakness: A Case Report

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ABSTRACT

Weakness and osteoarthritis are common concerns for orthopaedic and primary care physicians when caring for aging adults. We describe a 58-year-old woman with a history of Sjogren syndrome and knee osteoarthritis. She presented to our clinic for injection of viscosupplementation in her left knee, and review of her medical records revealed right hand weakness at 7 years after the onset of symptoms. Findings of muscle biopsy and multiple electromyograms revealed inclusion body myositis, primarily affecting the deep finger flexors and quadriceps muscles. On the basis of this diagnosis, physical therapy and supportive care were recommended. The results of the current case show the difficulty of diagnosing inclusion body myositis and why it often remains undiagnosed.

Keywords: Inclusion Body Myositis, Inflammatory, Myopathy

INTRODUCTION

Inclusion body myositis (IBM) is an idiopathic inflammatory myopathy (IIM) found more often in men than women and commonly acquired after age 50.[1] Data regarding causes of IBM are scarce; however, the prevalence is estimated to be between 5 and 25 of 1,000,000 patients, with some studies reporting rates as high as 45 of 1,000,000 patients.[2-4] Studies have suggested an association between primary Sjogren syndrome and IBM, but significance has not been determined.[5]

Patients with IBM typically present with progressive asymmetric weakness in the quadriceps and finger flexors (Table 1). The average time from onset of symptoms to definitive diagnosis is about 5 years.[2] Because of the duration, multiple muscle groups may become weak (eg, hip flexors, quadriceps, ankle dorsiflexors, forearm flexors, cricopharyngeal muscle, and orbicularis oculi muscle), whereas the oculomotor muscles typically remain unaffected. Although dysphagia is seldom the presenting symptom, it may be present.[6] After objective muscle weakness is seen, laboratory test results may be reasonably obtained. Findings can reveal mildly elevated muscle enzymes early in the disease process; however, the enzymes usually normalize as the disease progresses. A creatine kinase (CK) level more than 15 times the normal limit is atypical, thus prompting a search for an alternative diagnosis. Typically, erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels are not elevated and myositis-specific antibodies are not present.[7] Notably, autoimmune disorders such as Sjogren syndrome can be associated with IBM; however, the pathophysiology behind this is not understood and potentially an area for future research.[8]

An electromyogram (EMG) and nerve conduction study are helpful in diagnosing IIM. Findings between IBM can be similar to those of IIM, including increased insertional activity, positive waves, fibrillations, and small-amplitude polyphasic motor unit action potentials. Fasciculations, however, are only observed with IBM. With these findings, a muscle biopsy is indicated for histological diagnosis. Biopsy reveals evidence of endomysial inflammation with invasion of non-necrotic muscle fibers (particularly CD8+ T lymphocytes and macrophages),[9] sarcoplasmic "rimmed" vacuoles that are red-rimmed on trichrome stain and blue on hematoxylin and eosin, and immunostaining that is positive for p62 and TDP-43 labeled protein aggregates.[10] Electron microscopy findings may show inclusions that contain 15 nm to 18 nm tubulofilaments within the sarcoplasm and myonuclei.[7] Proposed diagnostic criteria for IBM are

Table 1. Comparison of inclusion body myositis and polymyositis[a]

Variable	Inclusion body myositis	Polymyositis
Age	Uncommon before 50 years	Common before 50 years
Sex	Male > female	Female > male
Onset	Insidious	Acute or subacute
Course	Slowly progressive	More rapid
Weakness	Typically asymmetric finger flexors and proximal leg weakness	Symmetric, proximal
CK level	Normal or < 10x normal	Often > 10x normal
EKG findings	Myopathic or mixed myopathic and neurogenic	Myopathic
Muscle biopsy findings	Inflammation, rimmed vacuoles, inclusions	Inflammation, fiber necrosis
Response to therapy	Generally poor	Expected

CK, creatine kinase; EKG, electromyogram.
[a]Table adapted with permission from: Miller ML, Lloyd TE. Clinical manifestations and diagnosis of inclusion body myositis. In: UpToDate, Post TW (Ed), UpToDate, Waltham, MA. Accessed on January 14, 2019. Copyright © 2019 UpToDate, Inc. For more information visit www.uptodate.com.

based on expert opinion or consensus groups. Lloyd et al[7] derived possibly the most clinically useful set of criteria, including quadriceps or finger flexor weakness, endomysial inflammation, and invasion of non-necrotic muscle fibers or rimmed vacuoles. This set of criteria provided a 90% sensitivity and 96% specificity.

Recommendations for treatment include exercise, physical therapy, speech therapy, nutritional support, and fall prevention with assistive devices if needed. Data from muscular dystrophy suggest that supplementation of 3 g creatine monohydrate per day improves muscle strength and performance; however, no formal placebo-controlled trial using creatine with IBM exists.[11] Although immunosuppressive therapy may be helpful in other inflammatory myopathies (eg, dermatomyositis, polymyositis, and necrotizing myopathy), it is generally not recommended for treating IBM.[12] We describe a middle-aged woman with progressive muscle weakness. The findings of this case reveal the challenges in diagnosing IBM.

CASE REPORT

A 58-year-old woman with a history of osteoarthritis in both knees, Sjogren syndrome, chronic obstructive pulmonary disease, gastroesophageal reflux disease, and tobacco abuse presented to the orthopaedic sports medicine clinic for consideration of viscosupplementation injection in her left knee. The patient had been receiving these injections intermittently for several years. More recently, she had undergone total knee replacement to treat her right knee osteoarthritis. At this visit, she noted difficulty when standing from a seated position in addition to her usual arthritis symptoms. Findings of a functional examination confirmed quadriceps weakness.

The patient's medical history revealed concerns of right hand grip weakness after being hospitalized for viral pneumonia 7 years earlier. Her primary care physician referred her to occupational therapy for treatment of two possible conditions that may have resulted after hospitalization: ulnar neuropathy and brachial plexus injury. When her hand weakness persisted, she was referred to a neurologist, at which time workup did not reveal a definitive cause but her EMG showed evidence of "EMG disease." The patient did not follow-up. She eventually returned to her primary care physician with concerns of right hand weakness that affected her ability to hold her grandchild.

Nerve conduction studies were performed in which a second EMG was obtained, revealing diffused electrical activity with needle insertion suggestive of "EMG disease" or myopathic process. There was no evidence of polyneuropathy, mononeuropathy, radiculopathy, or denervation changes. It was suggested her condition was either diffuse myositis due to systemic involvement of Sjogren syndrome, or critical illness myopathy due to her hospitalization for pneumonia. Laboratory test results showed the following: normal complete blood count; depressed thyroid-stimulating hormone, 0.03; elevated levels of antithyroid peroxidase antibodies; normal comprehensive metabolic profile; normal B12, 247.90 pmol/L; elevated ESR, 104 mm/h; elevated CRP, 18.09 nmol/L; positive antinuclear antibody, 1:1280; elevated anti-Sjogren syndrome antigens, A and B; and normal CK levels, 1.1189 µkat/L. Findings of brain magnetic resonance imaging (MRI) revealed no evidence of neoplasm, multiple sclerosis, cerebrovascular accident, or other intracranial process.

The patient was referred back to a neurologist for further evaluation. During this time, she had a fair amount of weakness and atrophy in her interosseous muscles, abductor pollicis brevis, and flexor mass. Additionally, she had mild weakness of both quadriceps. A third EMG was obtained, which revealed evidence of an irritable myopathy. Findings of a biceps biopsy

test were suggestive of IBM and revealed the following: presence of rimmed vacuoles with Gomori trichrome staining and an immunostaining pattern with p62, ubiquitin, and TDP-43. Definitive diagnosis of inclusion body myositis was made 7 years after onset of symptoms. Recommendations were given for supportive care and continued physical therapy. Weakness continued to progress very slowly during the next 6 to 12 months; however, she was able to continue her activities of daily living with physical therapy.

DISCUSSION

IBM is a rare type of IIM, which should be considered to occur more frequently in middle-aged adults presenting with insidious onset muscle weakness of the quadriceps and finger flexors. The findings of our case show the difficulty in diagnosing IBM and why it often goes undiagnosed for an extended time. The diagnostic findings in this case support those of other published data regarding this condition, including the patient's insidious presentation, normal CK levels, and normal imaging and biopsy findings. Using the diagnostic criteria proposed by Lloyd et al[7] (ie, quadriceps or finger flexor weakness, endomysial inflammation, and invasion of non-necrotic muscle fibers or rimmed vacuoles) would have led to the diagnosis of IBM as well.

Some methods may help in diagnosing and treating IBM. The time to definitive diagnosis could be decreased by maintaining a high clinical suspicion of patients presenting with quadriceps and finger flexor weaknesses, and also pursuing appropriate workup (eg, repeat EMG, MRI, and laboratory tests). Because IBM is uncommon, it is often an overlooked diagnosis; thus, by increasing awareness of this condition, the time to diagnosis may be improved. Practitioners caring for musculoskeletal conditions are uniquely positioned to recognize IBM. The findings of our case add to the relatively small amount of case reports documenting patients with IBM associated with Sjogren syndrome. More research is needed to help elucidate the connection between autoimmune disorders and IBM.

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