

Clinical Study

Idiopathic spinal cord herniation: an imaging diagnosis with a significant delay

Britton J. Carter, MD^{a,*}, Brent D. Griffith, MD^a, Lonni R. Schultz, PhD^b,
Muwaffak M. Abdulhak, MD^c, Daniel S. Newman, MD^d, Rajan Jain, MD^e

^aDepartment of Radiology, Henry Ford Health System, Detroit, MI, USA

^bDepartment of Public Health Sciences, Henry Ford Health System, Detroit, MI, USA

^cDepartment of Neurosurgery, Henry Ford Health System, Detroit, MI, USA

^dDepartment of Neurology, Henry Ford Health System, Detroit, MI, USA

^eDivision of Neuroradiology, Department of Radiology, NYU Langone Medical Center, 221 Lexington Ave, New York, NY 10016, USA

Received 22 September 2014; revised 2 March 2015; accepted 2 April 2015

Abstract

BACKGROUND CONTEXT: Idiopathic spinal cord herniation (ISCH) is an underrecognized entity that is often underappreciated by the neurosurgery and neuroradiologic communities. This leads to delayed diagnosis, multiple imaging studies, other diagnostic tests, inappropriate surgeries, and repeat office visits.

PURPOSE: To evaluate common associations between ISCH and patient demographics/clinical presentation and to analyze the potential for delayed diagnosis.

PATIENT SAMPLE: Patient sample included those diagnosed with ISCH on imaging at our institution from June 20, 2005 to December 3, 2012.

OUTCOME MEASURES: These were based on the patient improvement/stability/decline based on the patients' most recent clinic/office visit when compared with initial presentation.

METHODS: A retrospective search of radiology reports was performed using Illuminate software from June 20, 2005 to December 3, 2012, using the search term "idiopathic spinal cord herniation." Clinical data were reviewed including patient's age, sex, presenting clinical symptoms, number and type of imaging studies performed as part of the workup, other diagnostic tests, pain procedures, surgeries, and time between original presentation and diagnosis of ISCH on imaging.

RESULTS: A total of 55 patients had the search term "idiopathic spinal cord herniation" included in their radiology report, of which 37 patients were found to meet the imaging and clinical diagnosis of ISCH. The median time from presentation to imaging diagnosis was 20 months in patients younger than 60 years and 5 months in those 60 years or older ($p=.02$). Of the 37 patients evaluated, 27 (73%) had no change in symptoms, 5 patients (14%) experienced worsening of symptoms, and 5 (14%) experienced symptom improvement from original presentation to most recent office visit. Among all patients evaluated, three underwent repair of the ventral dural defect in ISCH, resulting in clinical improvement. There was a median of nine outpatient office visits, three magnetic resonance images (MRIs), and one electromyography (EMG) per patient presenting with ISCH. The most frequent complaints were neck/upper back pain in 70%, upper/lower extremity numbness/parasthesias/weakness in 49%, hyperreflexia in 22%, and burning chest pain in 22%.

CONCLUSIONS: Prolonged time to diagnosis and subsequent treatment of ISCH protracts patient symptoms and is associated with redundant diagnostic tests and patient visits. Earlier use of MRI in younger patients (younger than 60 years) may be warranted in those with a clinical presentation suggestive of Brown-Sequard symptomatology. Increasing recognition of ISCH in imaging and

FDA device/drug status: Not applicable.

Author disclosures: **BJC:** Nothing to disclose. **BDG:** Nothing to disclose. **LRS:** Nothing to disclose. **MMA:** Nothing to disclose. **DSN:** Nothing to disclose. **RJ:** Nothing to disclose.

Oral presentation at 2013 American Society of Neuroradiology Annual Conference, San Diego, CA. The authors have no disclosures to make.

* Corresponding author. K3 Department of Radiology, Henry Ford Hospital, 2799 West Grand Blvd, Detroit, MI 48202, USA. Tel.: (1) 313-916-1384; fax: (1) 313-916-8857.

E-mail address: brittonc@rad.hfh.edu (B.J. Carter)

surgical communities would lead to improved patient care. © 2015 Elsevier Inc. All rights reserved.

Keywords: Idiopathic spinal cord herniation; ISCH; Overutilization; Dural defect; Health care costs; Delayed diagnosis

Introduction

Idiopathic spinal cord herniation (ISCH) was first described by Wortzman et al. [1] in a 1974 case report involving herniation of the thoracic spinal cord resulting in neurologic symptoms. Idiopathic spinal cord herniation is classically described as occurring in middle-aged adults with a preponderance of women [2]. Most cases describe symptoms of Brown-Sequard syndrome, characterized by ipsilateral paralysis, loss of vibratory and position sense, contralateral loss of pain and temperature sensation, or other myelopathic sequelae [3]. Symptoms are typically unilateral from herniation of the lateral funiculus of the spinal cord in ISCH [3].

Recognition of ISCH in the literature has increased over the past decade, likely because of improvements in technique and utilization of spine magnetic resonance imaging (MRI); however, much of this is based on case reports and small series of patients. As such, the entity remains underrecognized and poorly understood, particularly outside of the surgical spine and neuroradiology communities, leading to a significant delay in clinical diagnosis with few cases undergoing surgical repair. One of the major reasons for delay in diagnosis is a wide spectrum of nonspecific and minor symptoms at patient presentation. These delays, in turn, can lead to redundant diagnostic testing, ineffective therapies, and repeat health care visits because of ongoing symptoms. Currently, there is increased focus on improving the quality of health care delivery, with the goal to improve patient outcome and avoid ineffective medical practices. Therefore, increased awareness and appropriate management of underrecognized entities such as ISCH is an efficient way to improve patient care.

Failure to suspect and recognize ISCH can result in delayed diagnosis and unnecessary use of medical resources. The purpose of this study was to evaluate common associations between ISCH and patient demographics and clinical presentation and to analyze potential causes for delayed diagnosis. The goal of this study was to increase awareness of ISCH as a cause of myelopathy, which can be effectively treated, leading to improvement or at least an arrest of patient symptoms.

Materials and methods

Institution review board approval was obtained from Henry Ford Hospital for this Health Insurance Portability

and Accountability Act-compliant study, and informed consent was waived. A retrospective search of the Henry Ford Health System radiology database was performed using Illuminate software (Softtek Solutions, Inc., Prairie Village, KS, USA) from June 20, 2005 to December 3, 2012 with the search term “idiopathic spinal cord herniation.” The diagnosis of ISCH was based on the final report by a Certificate of Added Qualification (CAQ) board certified neuroradiologist. All patient imaging studies were reviewed again by a post graduate year 4 resident to ensure that an alternative diagnosis such as dorsal arachnoid cyst/web was not identified on computed tomography (CT) myelogram, when performed, and that the imaging findings were consistent with this diagnosis on all subsequent imaging. The criteria for diagnosis were based on the reported findings of Parmar et al. [4] and included an acute anterior kink of the thoracic spinal cord with enlargement of the dorsal subarachnoid space, cord deviation limited to one to two vertebral body levels, adherence of the cord to the ventral dura, and focal thinning of the cord. These imaging findings were also correlated to patient symptoms and considered symptomatic if the cord herniation was ipsilateral to the patient’s symptoms and if the symptoms corresponded to the dermatome and/or myotome for that spine level. There also needed to be a lack of an additional competing spine lesion such as multiple sclerosis, spinal/foraminal stenosis, or tumor. Electronic health records were then reviewed to identify patient demographics, presenting clinical symptoms, office visits, and inpatient days directly related to patients’ symptoms, number and type of imaging studies performed as part of the workup for patients’ myelopathic symptoms, EMGs, pain procedures, spine surgeries, and the period of time between the patients’ original presentation and having received the diagnosis of ISCH on imaging.

Statistical analysis

Descriptive statistics of means, standard deviations, medians, and ranges were computed for age at presentation, delay in diagnosis (in months), utilization, and costs. Percentages and sample sizes were computed for the gender and presenting symptoms. Wilcoxon two-sample *t* tests were done to assess the association between patient characteristics and delay in diagnosis. All testing was done at the 0.05 level. Statistical analyses were performed using SAS version 9.2 (SAS Institute Inc, Cary, NC, USA).

Download English Version:

<https://daneshyari.com/en/article/6212283>

Download Persian Version:

<https://daneshyari.com/article/6212283>

[Daneshyari.com](https://daneshyari.com)